

# KIC 008611876

## Q1-17 DR25 TCE Parameters

| TCE          | Run Type | KOI? | Period (Days) | Epoch (BKJD) | Depth (ppm) | Duration (Hours) | MES  | SNR | $R_{\star}$ ( $R_{\odot}$ ) | $T_{\star}$ (K) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|-----|-----------------------------|-----------------|------------------------|------------------------|
| 008611876-01 | OBS      | No   | 624.538021    | 192.227622   | 3450.8      | 4.206            | 13.1 | 7.1 | 0.23                        | 3288            | 1.59                   | 0.01                   |
| 008611876-02 | OBS      | No   | 264.532828    | 391.160973   | 2149.1      | 25.185           | 9.5  | 7.3 | 0.23                        | 3288            | 1.06                   | 0.02                   |
| 008611876-03 | OBS      | No   | 286.745126    | 251.930746   | 3239.9      | 6.687            | 11.7 | 6.6 | 0.23                        | 3288            | 1.30                   | 0.02                   |
| 008611876-04 | OBS      | No   | 242.948585    | 325.990640   | 2444.9      | 3.689            | 11.3 | 7.4 | 0.23                        | 3288            | 1.13                   | 0.03                   |
| 008611876-05 | OBS      | No   | 346.285635    | 168.337816   | 1354.2      | 7.906            | 10.4 | 3.1 | 0.23                        | 3288            | 0.93                   | 0.02                   |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments  |
|--------------|----------|------|-------|---|---|---|---|---|
| 008611876-01 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS |
| 008611876-02 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS                             |
| 008611876-03 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT   |
| 008611876-04 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT   |
| 008611876-05 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS     |

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

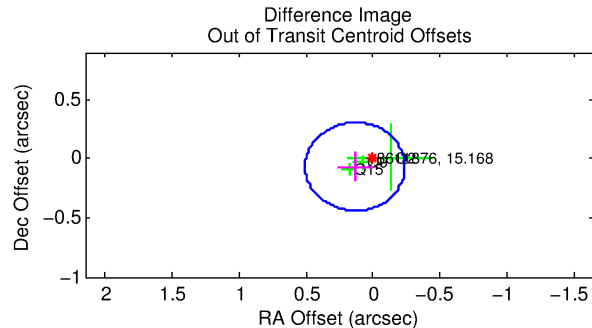
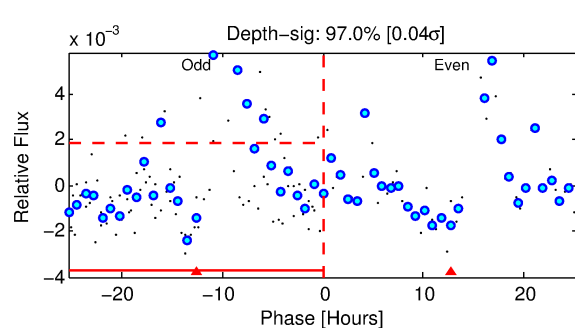
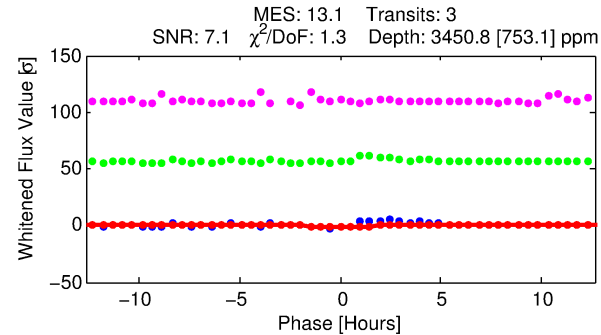
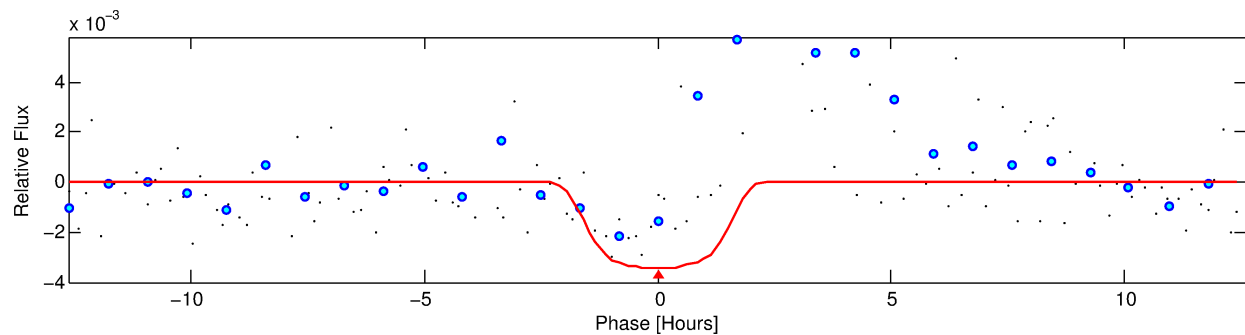
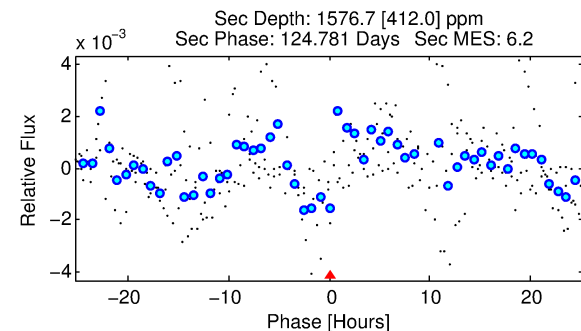
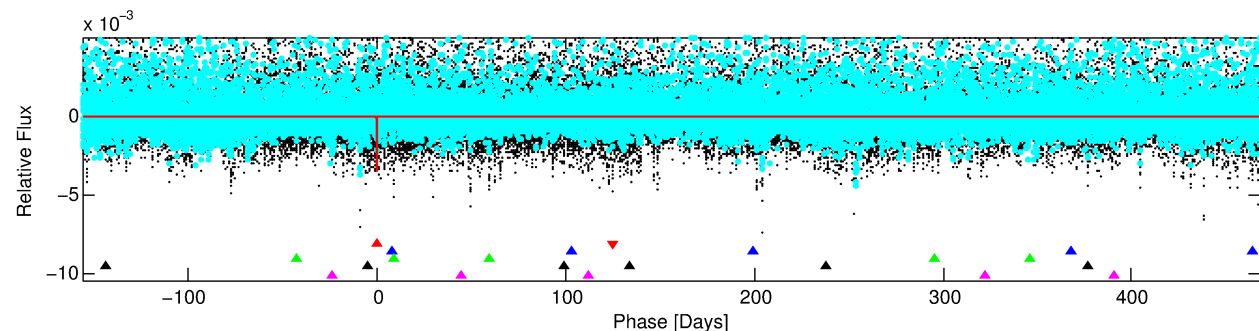
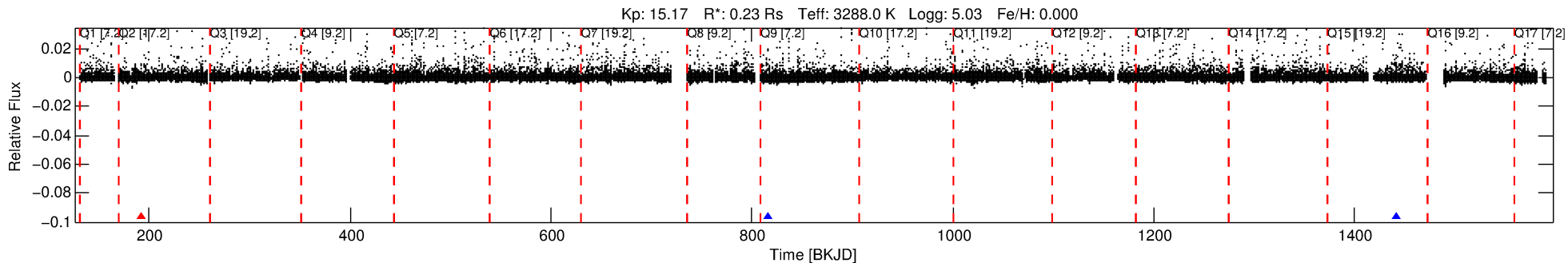
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 008611876-01

No Significant Match Found

# DV One-Page Summary

KIC: 8611876 Candidate: 1 of 5 Period: 624.538 d



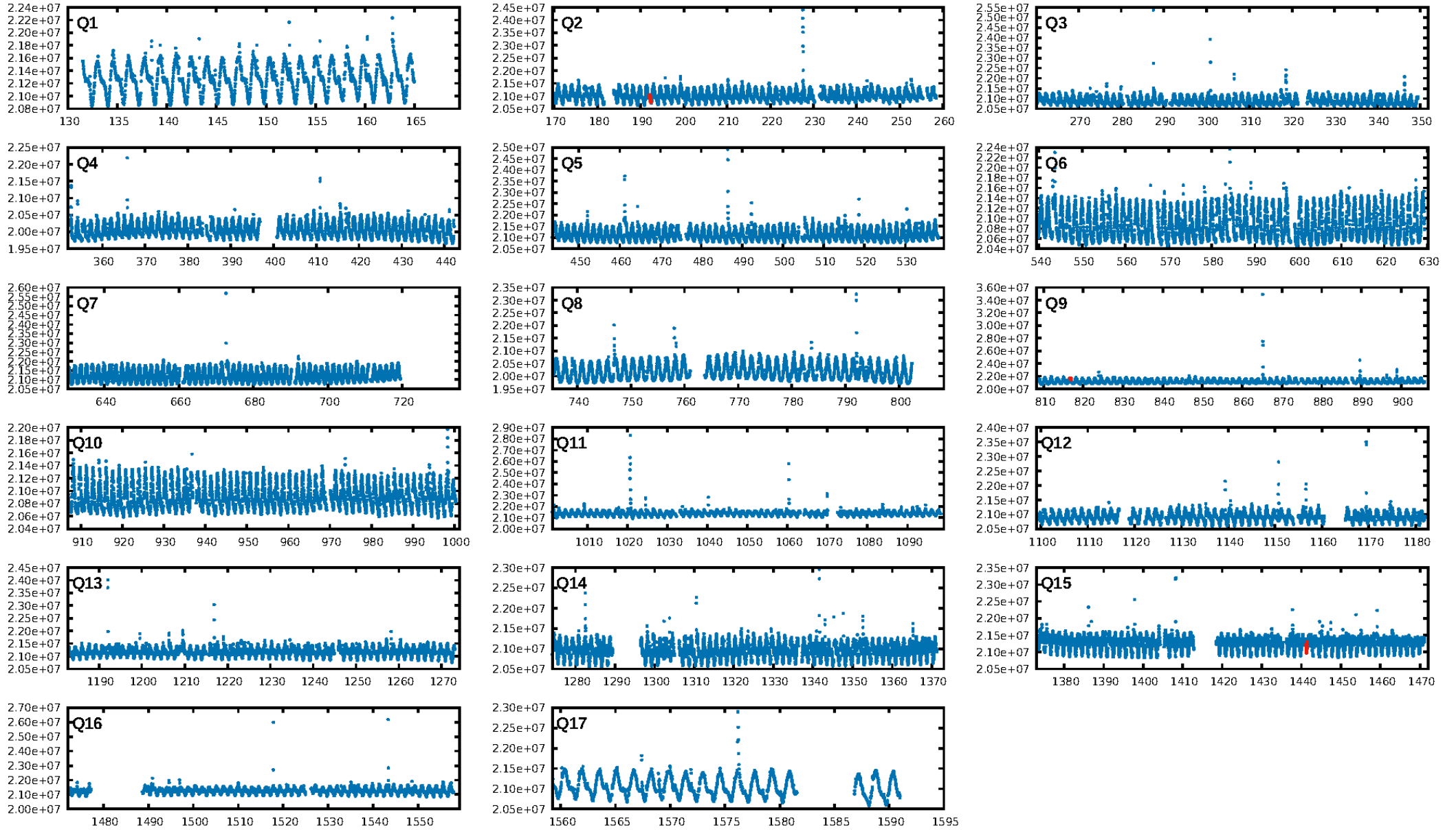
## DV Fit Results:

Period = 624.53802 [0.00822] d  
Epoch = 192.2276 [0.0106] BKJD  
Rp/R\* = 0.0632 [0.0112]  
a/R\* = 675.65 [305.32]  
b = 0.88 [0.12]  
Seff = 0.01 [0.00]  
Teq = 76 [3] K  
Rp = 1.59 [0.37] Re  
a = 0.8501 [0.0905] AU  
Ag = 246952.20 [113067.43] [2.18σ]  
Teffp = 2606 [290] K [8.73σ]

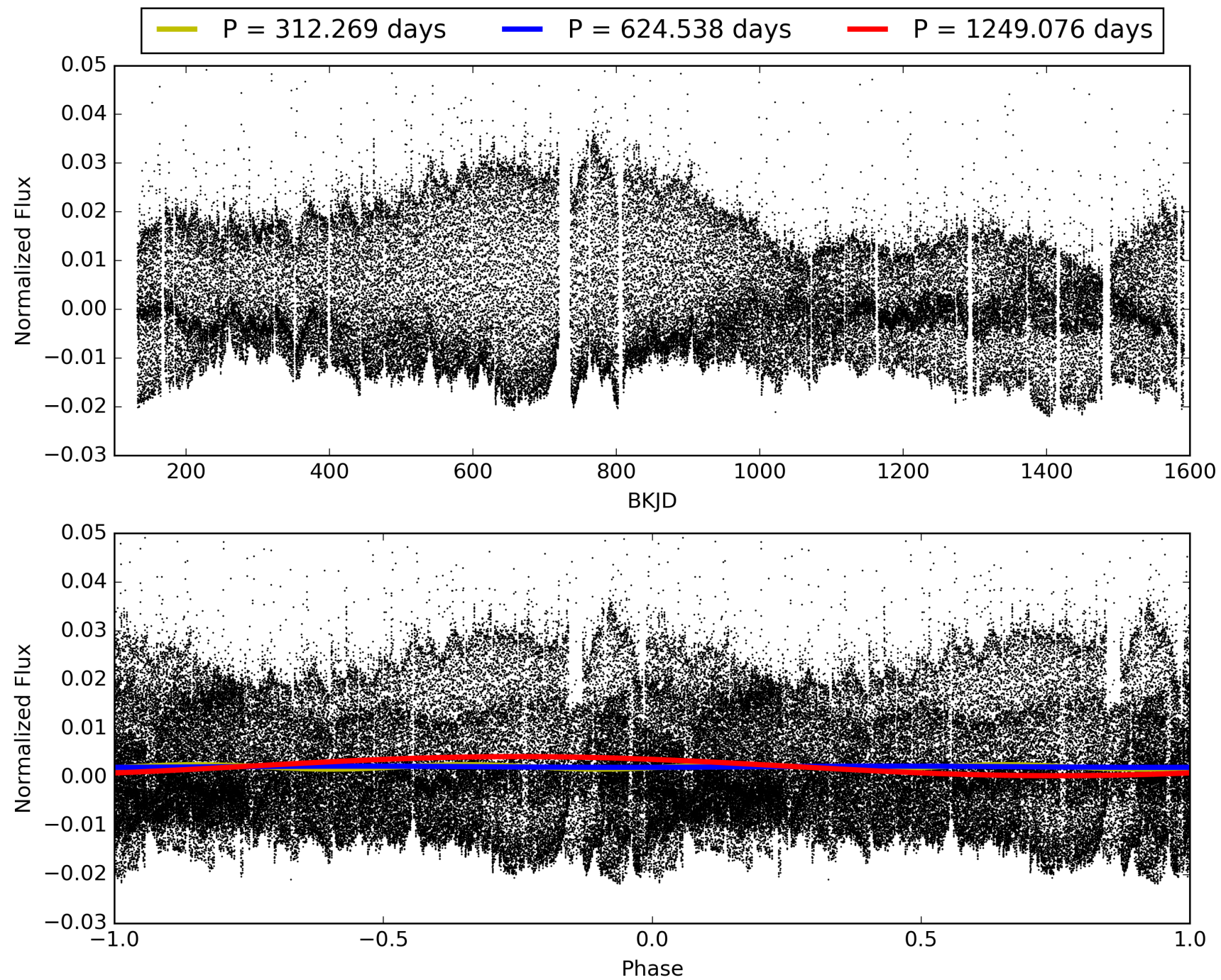
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [745.74σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 92.6%  
ModelChiSquareGof-sig: 99.9%  
Bootstrap-pfa: 5.85e-10  
RollingBand-fgt: 0.67 [2/3]  
GhostDiagnostic-chr: 0.3083  
Centroid-sig: 14.9%  
Centroid-so: 0.574 arcsec [1.18σ]  
OotOffset-rm: 0.150 arcsec [1.21σ]  
KicOffset-rm: 0.303 arcsec [2.51σ]  
OotOffset-st: 1/1/0/1 [3]  
KicOffset-st: 1/1/0/1 [3]  
DiffImageQuality-fgm: 0.67 [2/3]  
DiffImageOverlap-fno: 1.00 [3/3]

# TCE 008611876-01, PDC Light Curves



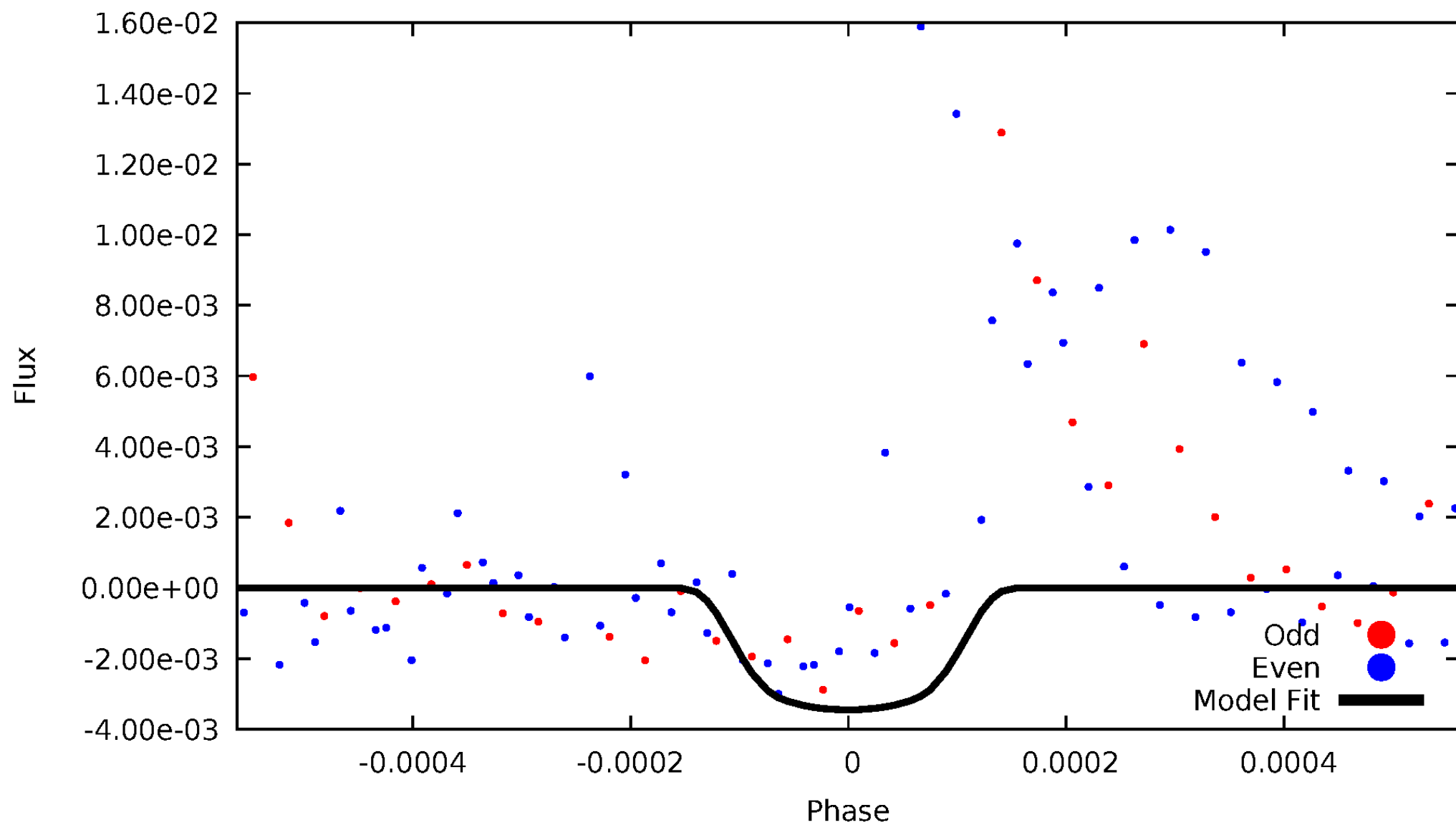
# TCE 008611876-01





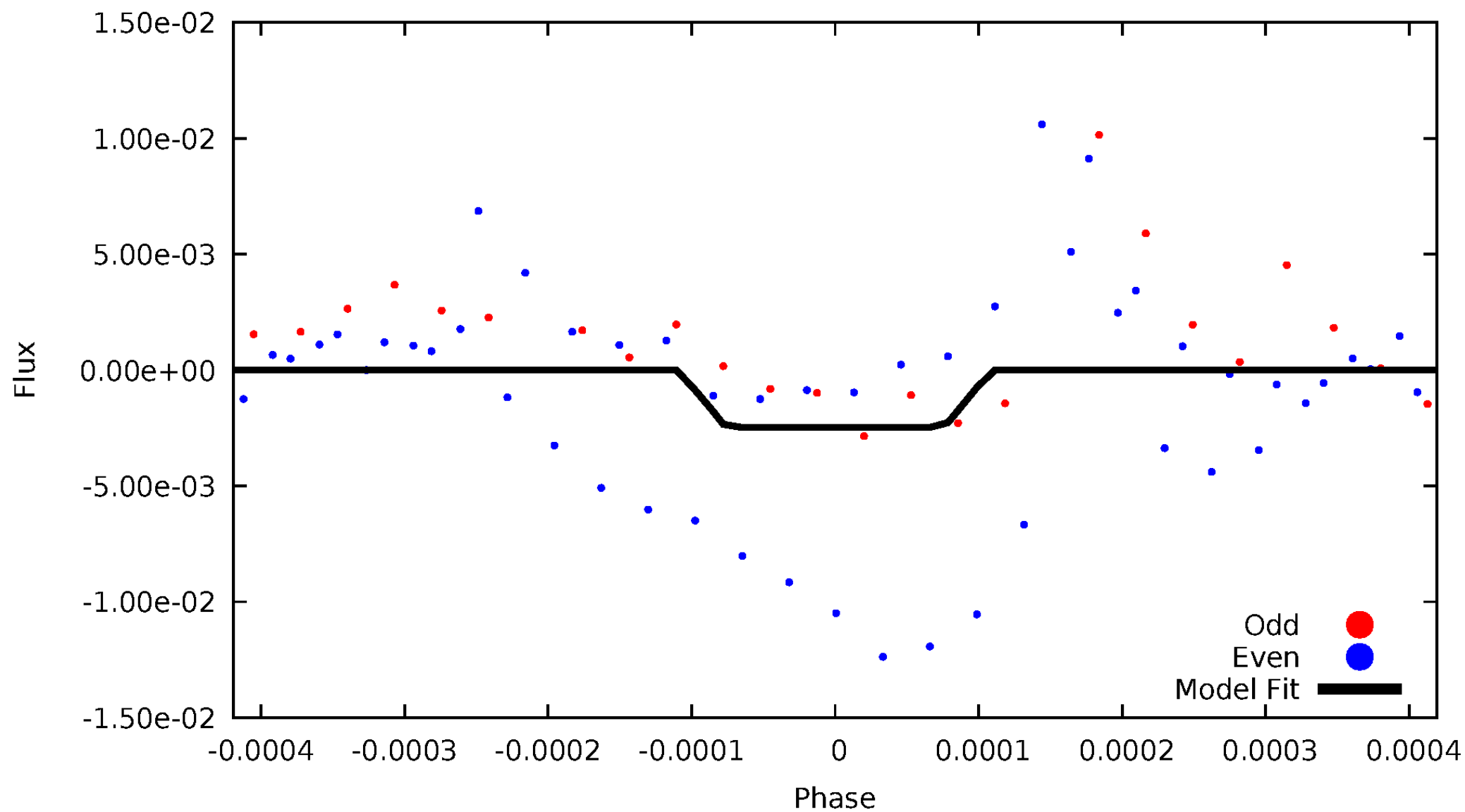
# DV Odd/Even

TCE 008611876-01



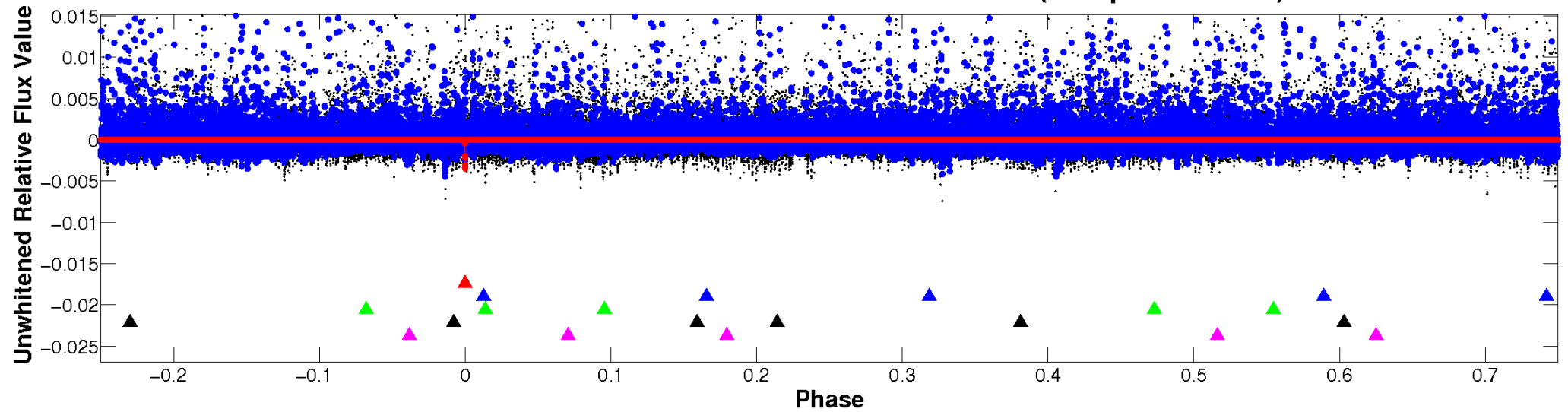
# ALT Odd/Even

TCE 008611876-01

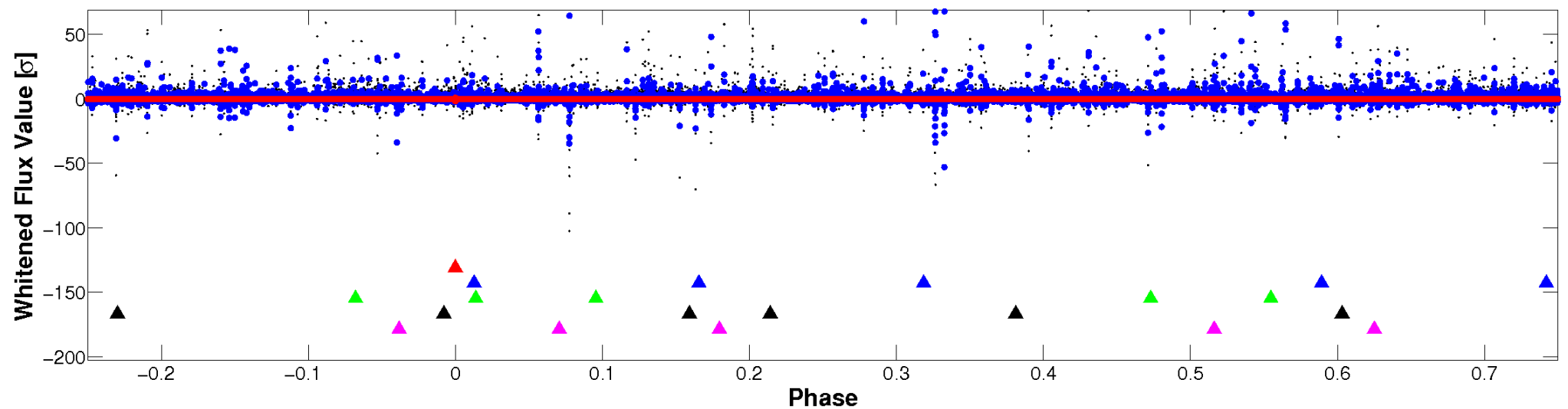


# Non-Whitened Vs. Whitened Light Curve

Planet 1 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

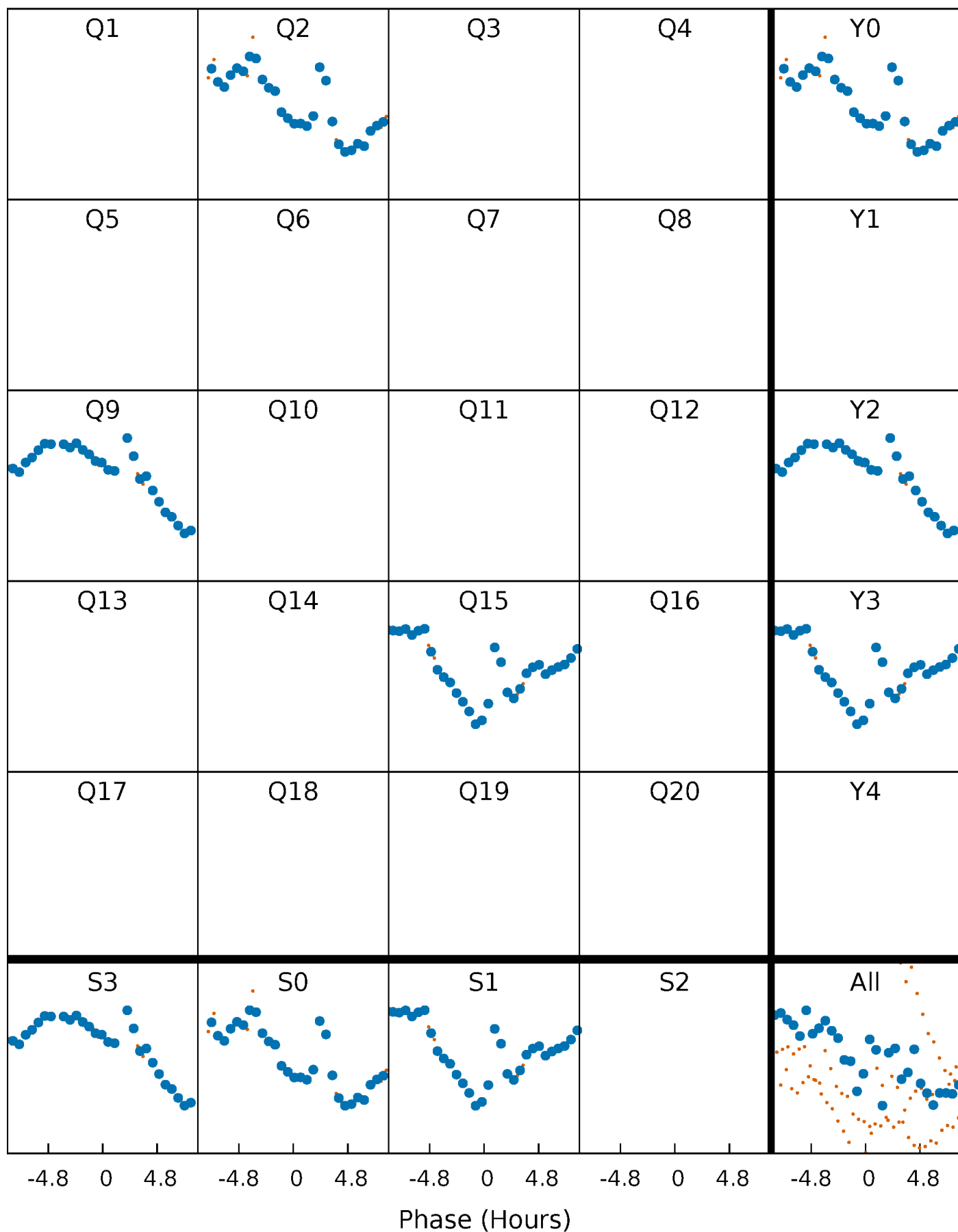


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

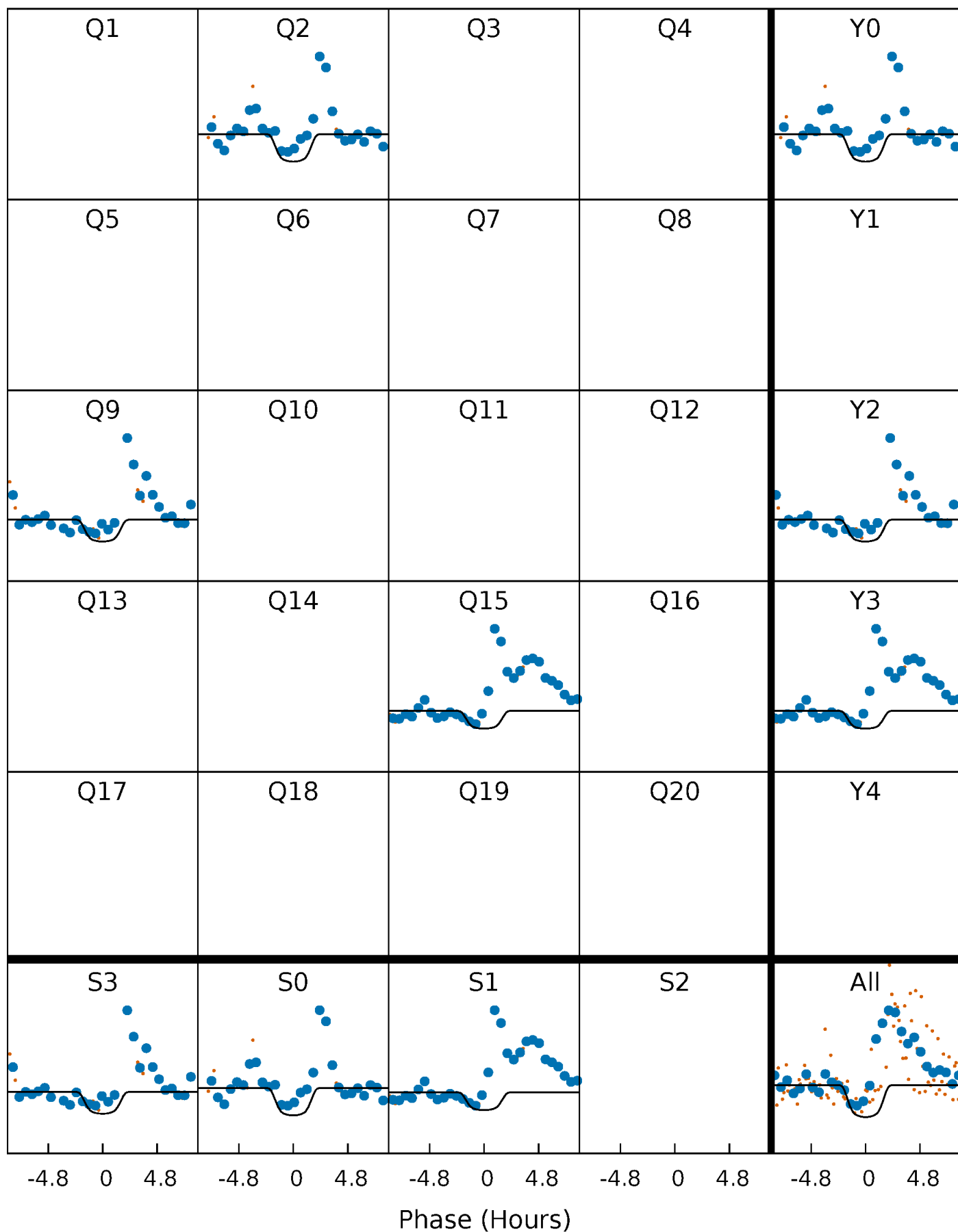
TCE 008611876-01 P=624.538021 Days  $T_0=192.227622$  (BKJD)





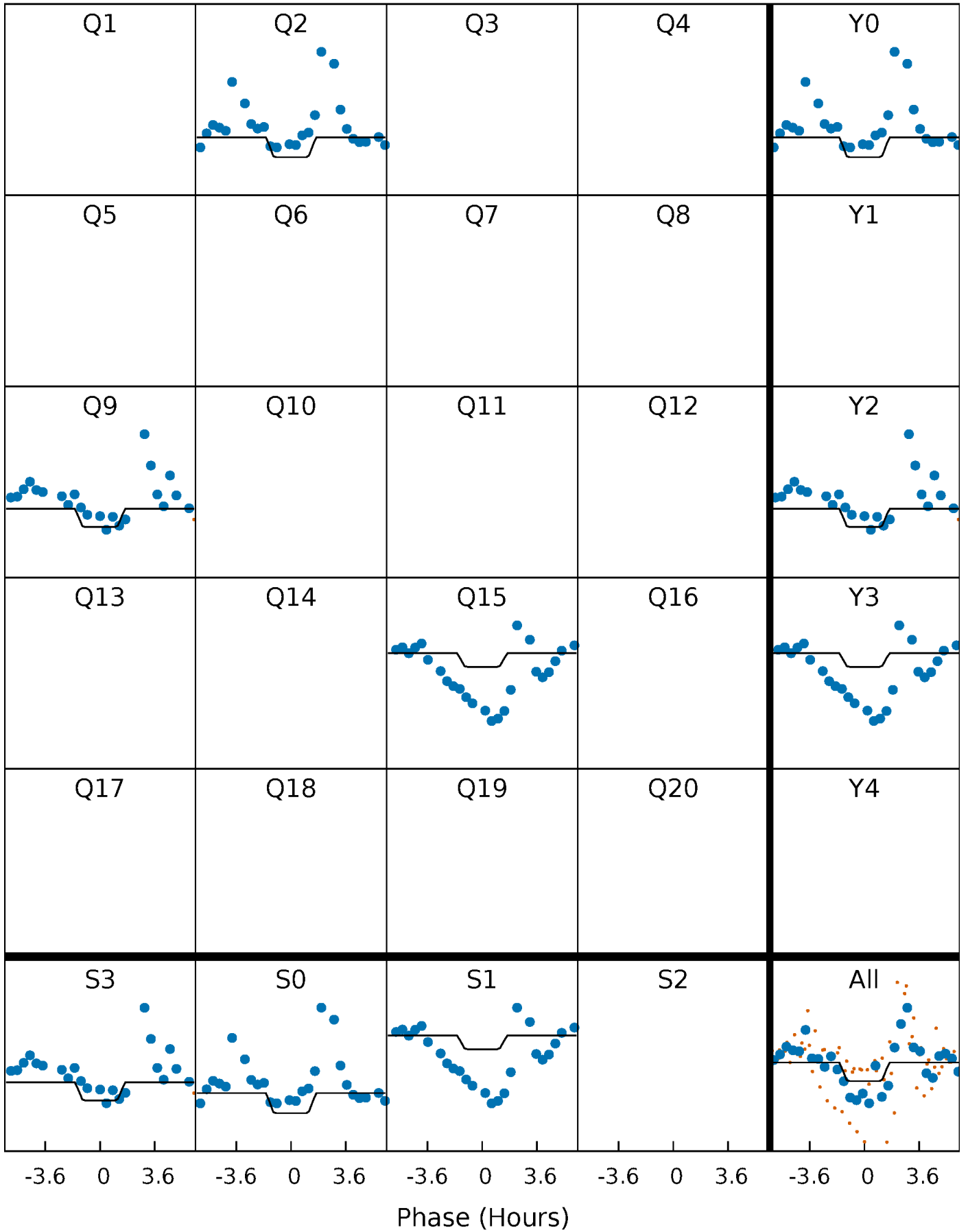
# DV Quarter-Phased Transit Curves

TCE 008611876-01 P=624.538021 Days  $T_0=192.227622$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

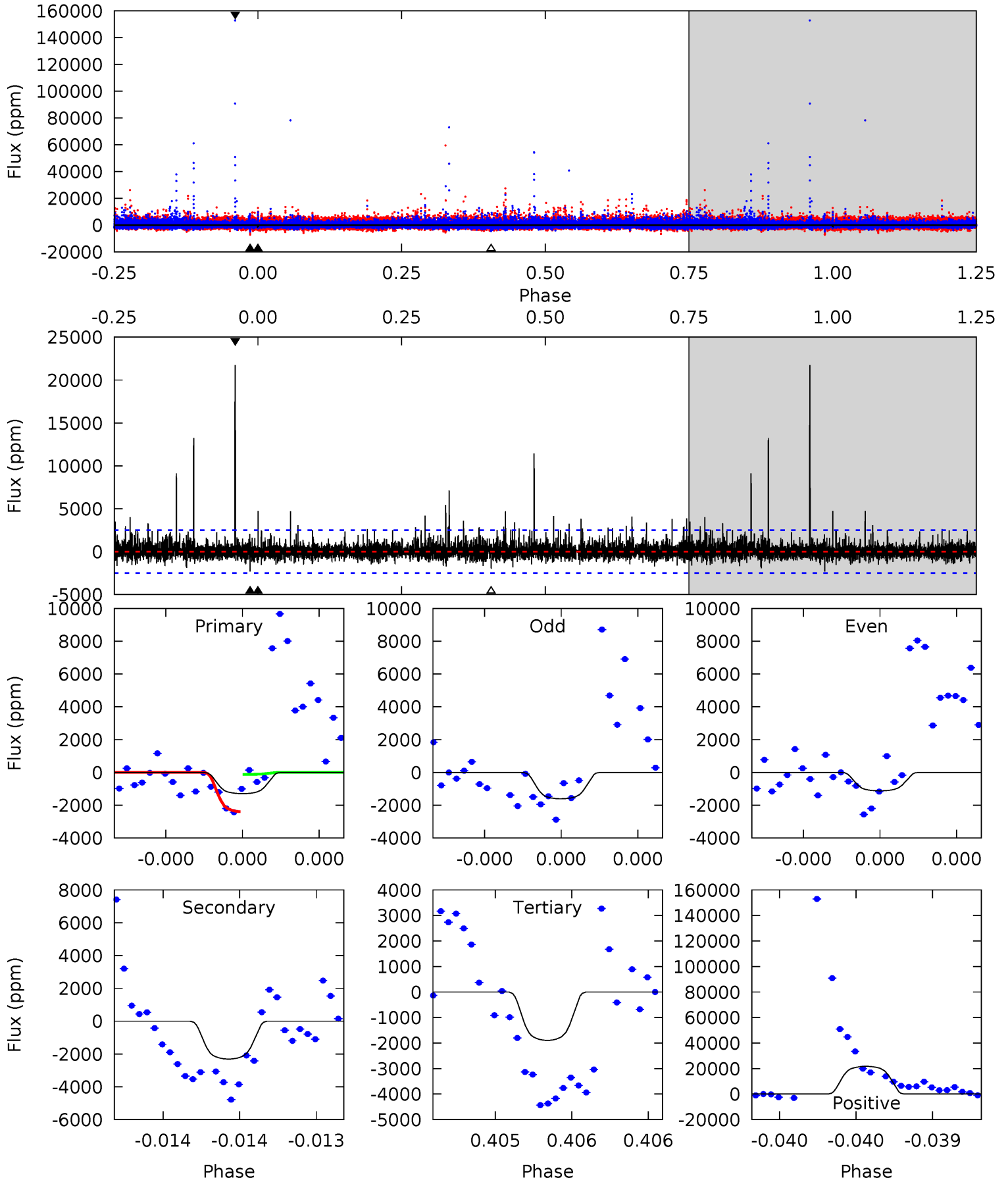
TCE 008611876-01 P=624.504083 Days  $T_0=192.234497$  (BKJD)



# DV Model-Shift Uniqueness Test

008611876-01, P = 624.538021 Days, E = 192.227622 Days

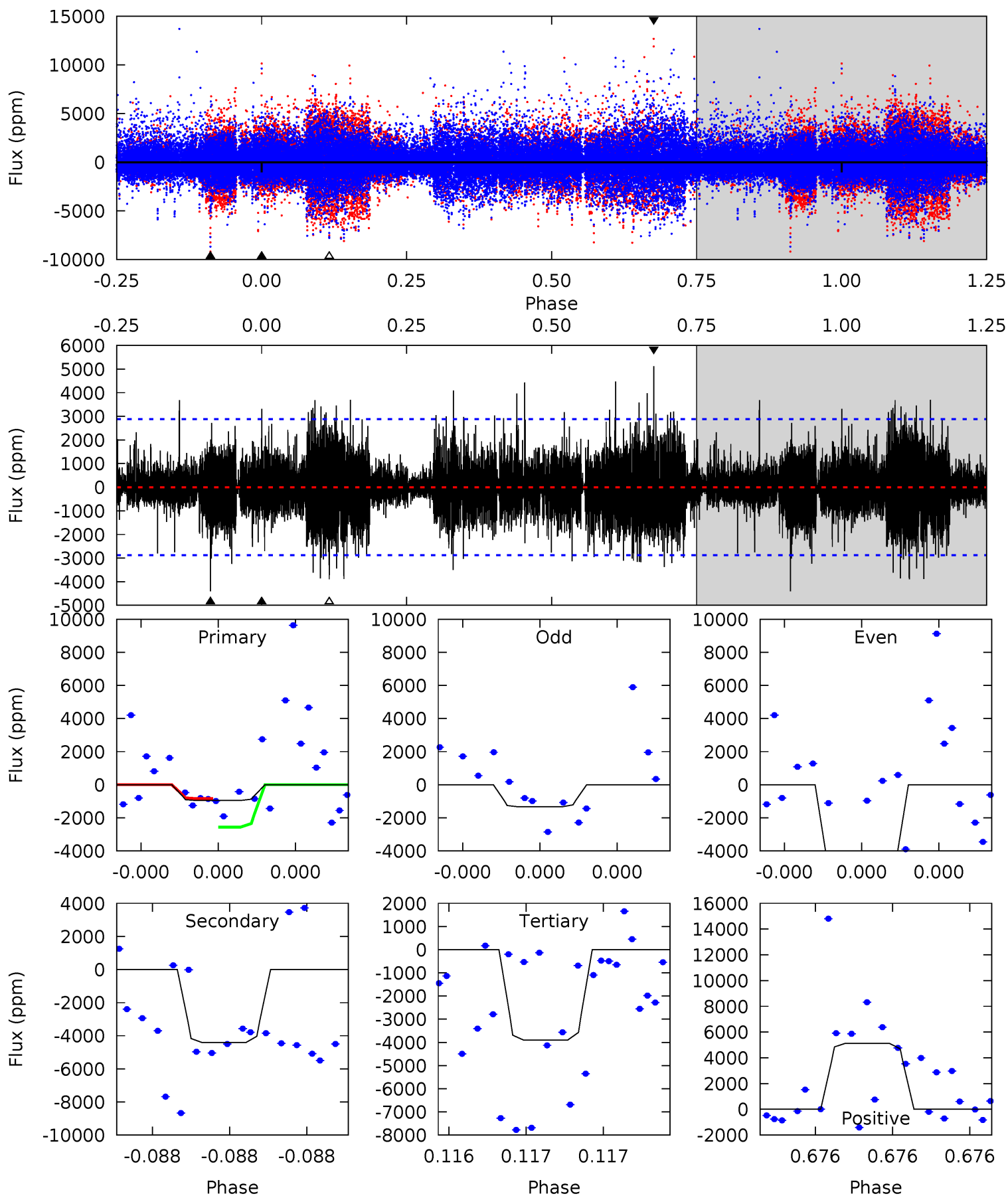
| Pri  | Sec  | Ter  | Pos  | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM   | Shape | TAT  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|-------|-------|------|
| 2.94 | 5.23 | 4.29 | 49.3 | 5.66            | 3.61            | 1.76             | -1.36   | -46.3   | 0.94    | -44.1   | 0.27    | -0.14 | 0.90  | 2.59 |



# Alt Model-Shift Uniqueness Test

008611876-01, P = 624.504083 Days, E = 192.234497 Days

| Pri  | Sec  | Ter  | Pos  | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 1.91 | 8.78 | 7.78 | 10.2 | 5.75            | 3.74            | 1.87             | -5.87   | -8.31   | 1.01    | -1.43   | 5.13    | 3.24 | 0.54  | 1.78 |





### Stellar Parameters For KIC 008611876

|        | $T_{\text{eff}}(K)$ | $\log(g)$                 | [Fe/H]                    | $R (R_{\odot})$           | $M(M_{\odot})$            | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|---------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
|        | $3288^{+44}_{-34}$  | $5.033^{+0.044}_{-0.044}$ | $0.000^{+0.100}_{-0.100}$ | $0.231^{+0.035}_{-0.025}$ | $0.210^{+0.041}_{-0.027}$ | $23.930^{+5.802}_{-5.075}$                |
|        | +1%/-1%             | +1%/-1%                   | +inf%/-inf%               | +15%/-11%                 | +20%/-13%                 | +24%/-21%                                 |
| Source | PHO2                | PHO2                      | PHO2                      | DSEP                      |                           |   |

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 008611876-01 / KOI

| Detrend | Depth (ppm)     | $R_p (R_{\oplus})$     | $T_{max} (K)$   | $T_{obs} (K)$        | $A_{obs}$                     |
|---------|-----------------|------------------------|-----------------|----------------------|-------------------------------|
| DV      | $-2309 \pm 441$ | $1.57^{+0.33}_{-0.29}$ | $106^{+3}_{-2}$ | $3044^{+210}_{-165}$ | $361899^{+217944}_{-114655}$  |
| Alt.    | $-4405 \pm 501$ | $1.25^{+0.33}_{-0.28}$ | $106^{+3}_{-3}$ | $3605^{+328}_{-237}$ | $1118555^{+752955}_{-406793}$ |

$T_{max}$  = Theoretical Maximum Planetary Temperature

$T_{obs}$  = Observed Planetary Temperature (Assuming A=0.3)

$A_{obs}$  = Observed Albedo (Assuming T=0)

If a secondary eclipse is present, the system is likely an EB if  $T_{obs} \gg T_{max}$  AND  $A_{obs} \gg 1.0$

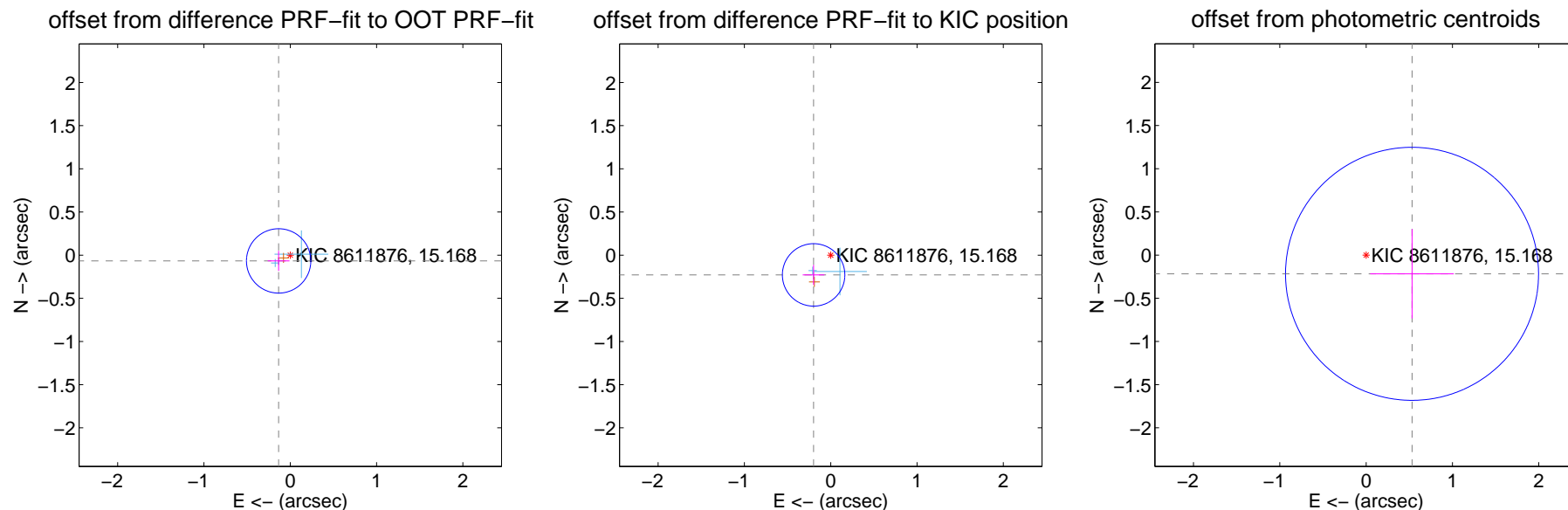
## DV Centroid Data

Supplemental centroid analysis for 008611876-01. Kepler magnitude: 15.17. Transit SNR 7.10

There are 2 quarters with good PRF difference image offsets

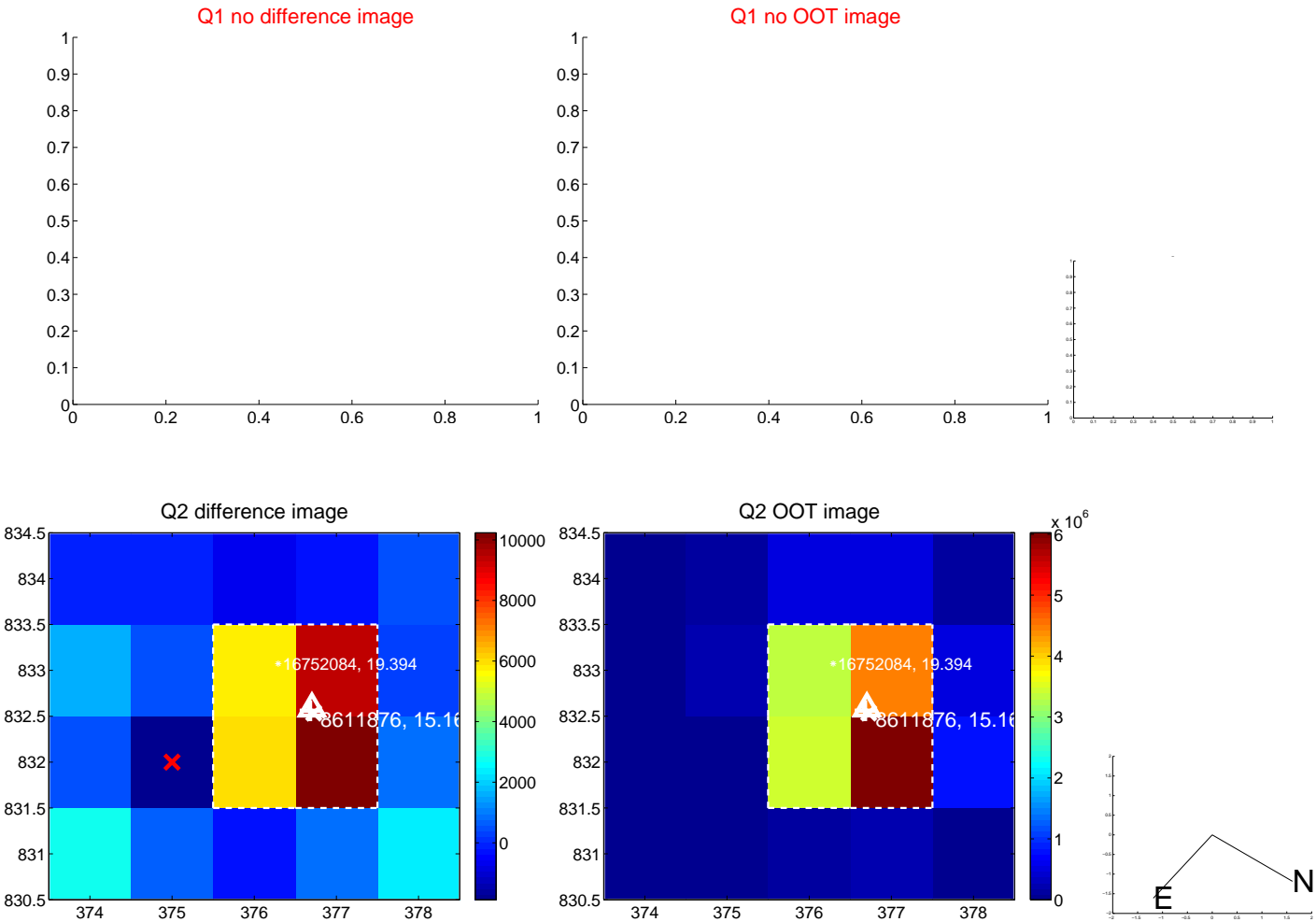
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

|   | Distance in arcsec | Distance / $\sigma$ | $\Delta$ RA       | $\Delta$ Dec       |
|---|--------------------|---------------------|-------------------|--------------------|
| PRF-fit source offset from OOT          | $0.150 \pm 0.124$  | 1.21                | $0.135 \pm 0.126$ | $-0.067 \pm 0.116$ |
| PRF-fit source offset from KIC position | $0.303 \pm 0.121$  | 2.51                | $0.198 \pm 0.126$ | $-0.229 \pm 0.116$ |
| photometric centroid source offset      | $0.57 \pm 0.49$    | 1.18                | $-0.53 \pm 0.48$  | $-0.22 \pm 0.52$   |



Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

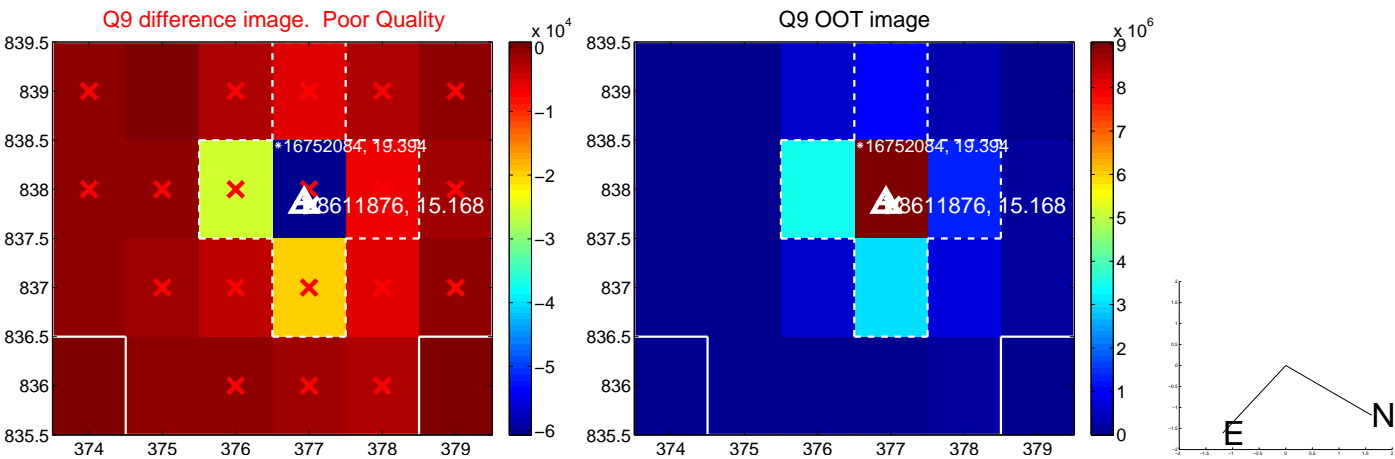


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

Q13 no difference image



Q13 no OOT image



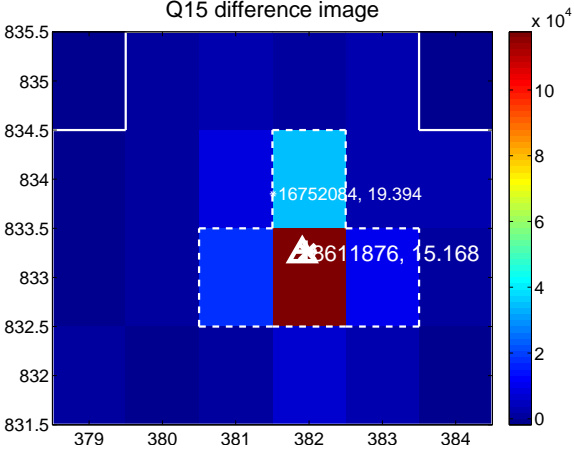
Q14 no difference image



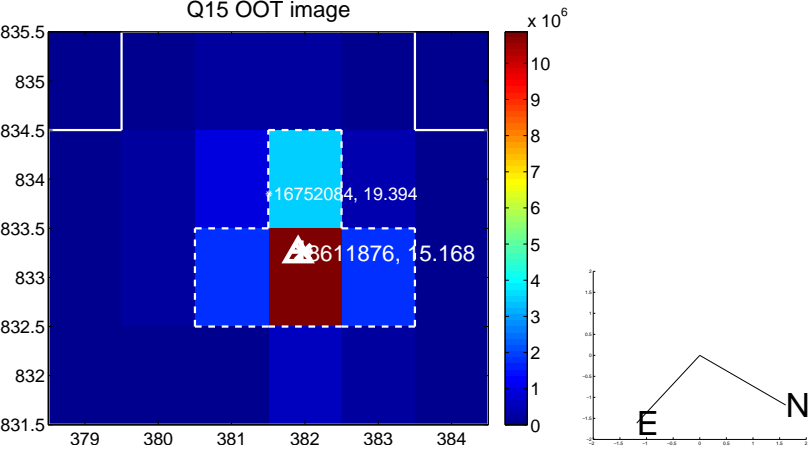
Q14 no OOT image



Q15 difference image



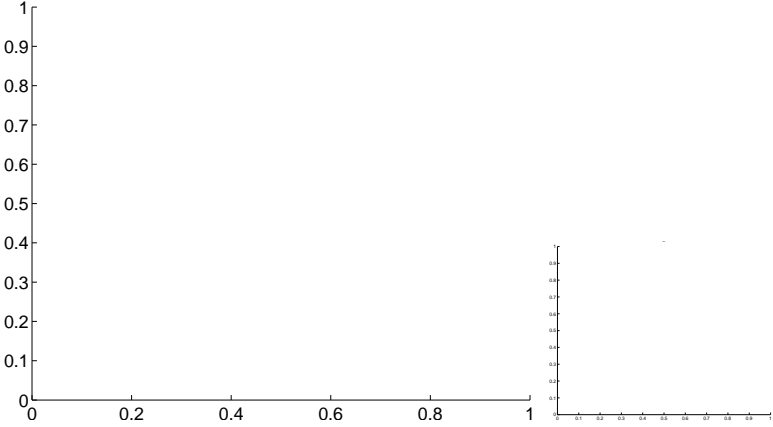
Q15 OOT image



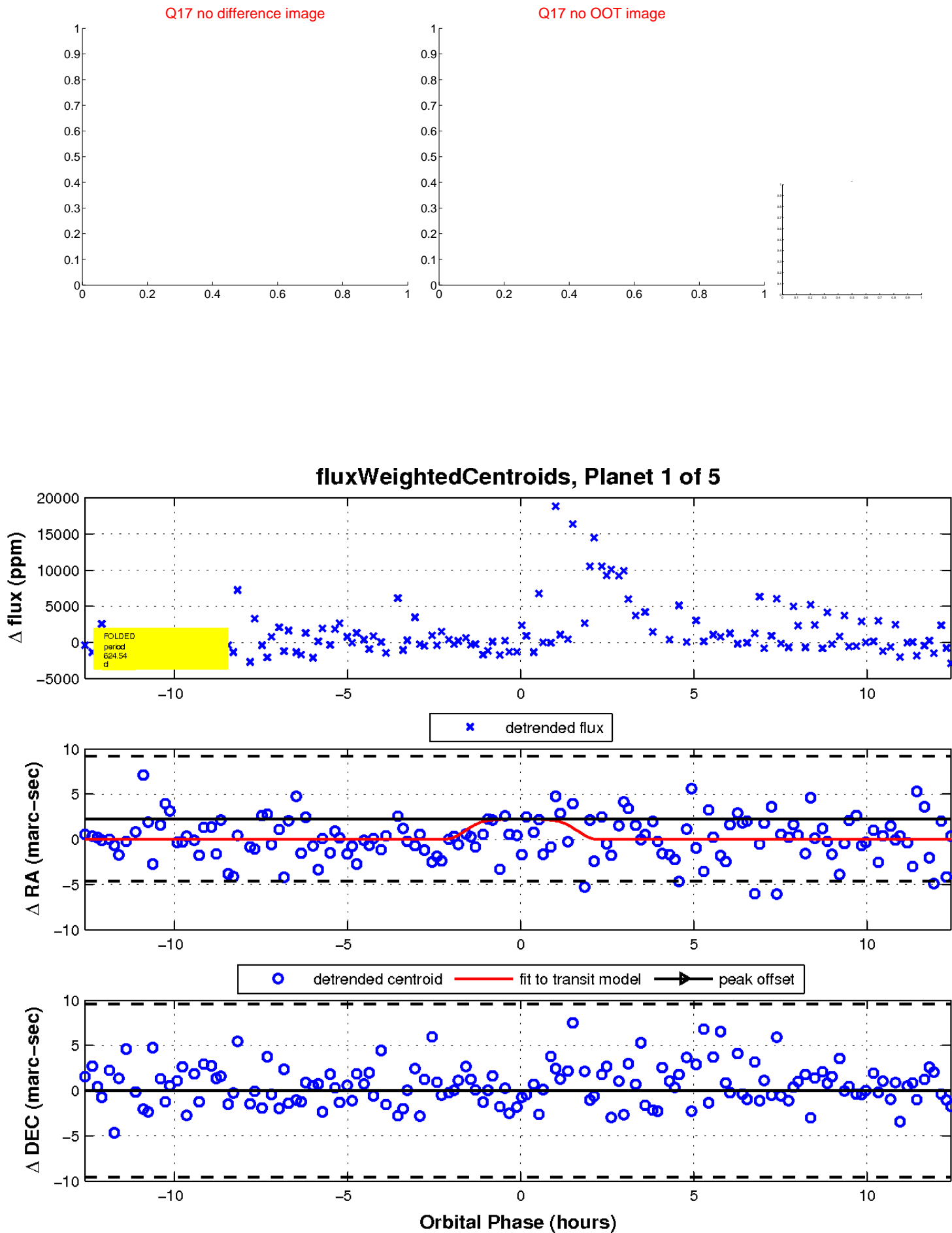
Q16 no difference image



Q16 no OOT image

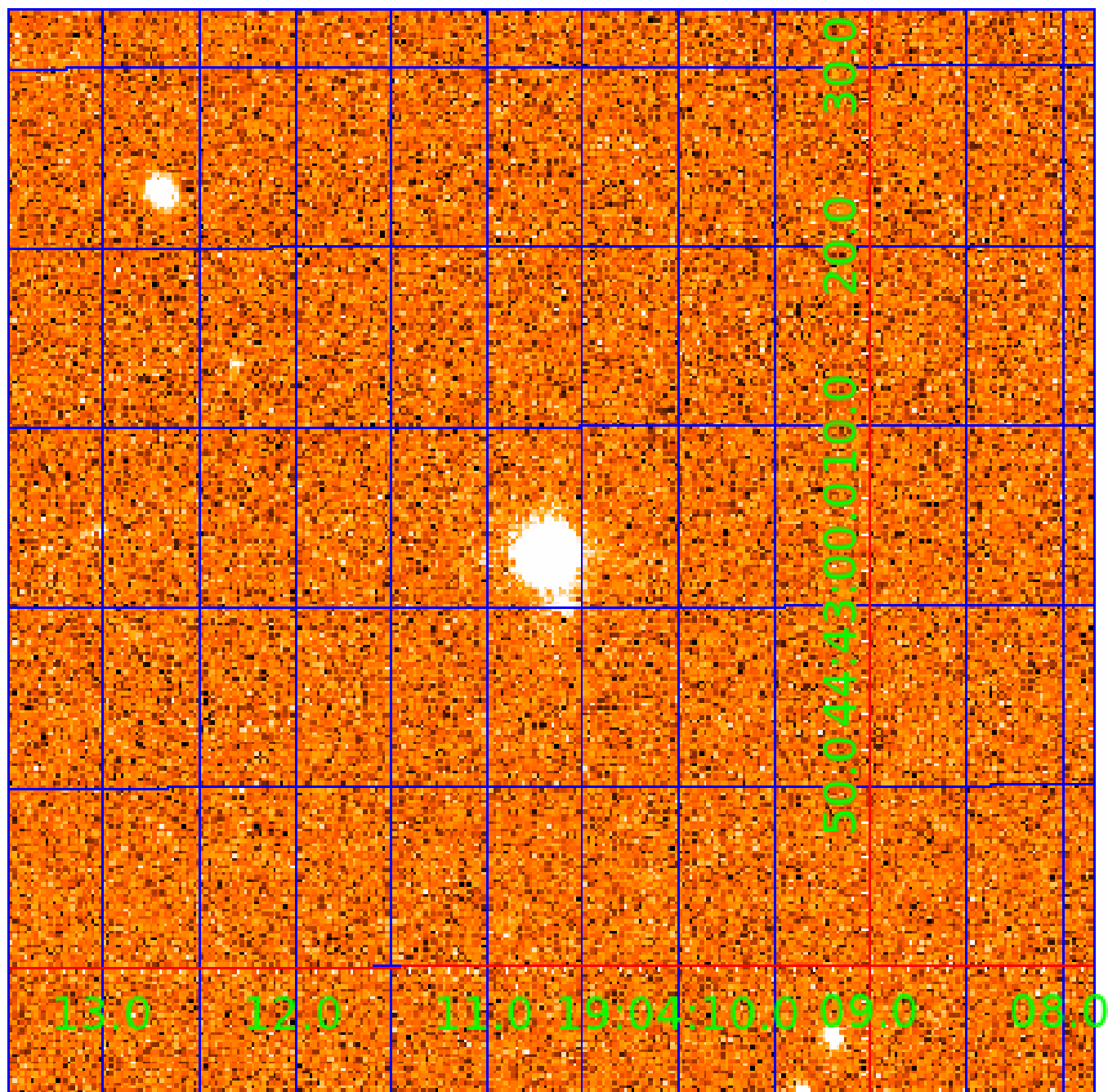


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



# UKIRT Image

Declination





# KIC 008611876

## Q1-17 DR25 TCE Parameters

| TCE          | Run Type | KOI? | Period (Days) | Epoch (BKJD) | Depth (ppm) | Duration (Hours) | MES  | SNR | $R_{\star}$ ( $R_{\odot}$ ) | $T_{\star}$ (K) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|-----|-----------------------------|-----------------|------------------------|------------------------|
| 008611876-01 | OBS      | No   | 624.538021    | 192.227622   | 3450.8      | 4.206            | 13.1 | 7.1 | 0.23                        | 3288            | 1.59                   | 0.01                   |
| 008611876-02 | OBS      | No   | 264.532828    | 391.160973   | 2149.1      | 25.185           | 9.5  | 7.3 | 0.23                        | 3288            | 1.06                   | 0.02                   |
| 008611876-03 | OBS      | No   | 286.745126    | 251.930746   | 3239.9      | 6.687            | 11.7 | 6.6 | 0.23                        | 3288            | 1.30                   | 0.02                   |
| 008611876-04 | OBS      | No   | 242.948585    | 325.990640   | 2444.9      | 3.689            | 11.3 | 7.4 | 0.23                        | 3288            | 1.13                   | 0.03                   |
| 008611876-05 | OBS      | No   | 346.285635    | 168.337816   | 1354.2      | 7.906            | 10.4 | 3.1 | 0.23                        | 3288            | 0.93                   | 0.02                   |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments  |
|--------------|----------|------|-------|---|---|---|---|---|
| 008611876-01 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS |
| 008611876-02 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS                             |
| 008611876-03 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT   |
| 008611876-04 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT   |
| 008611876-05 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS     |

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

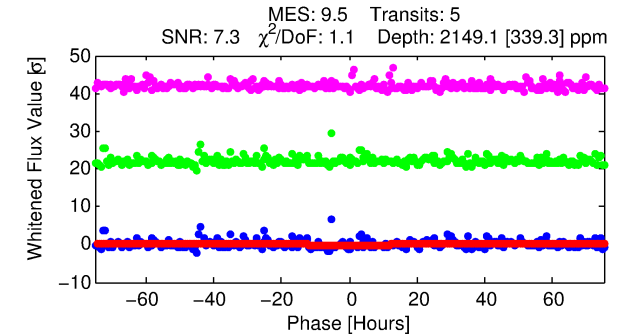
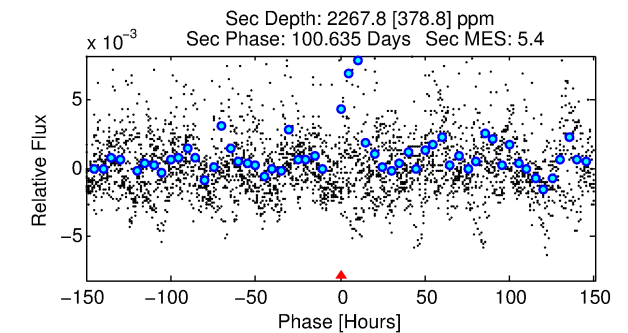
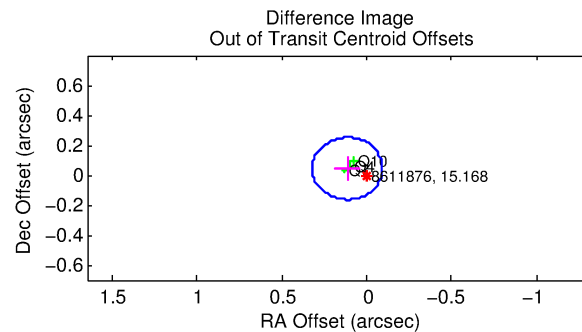
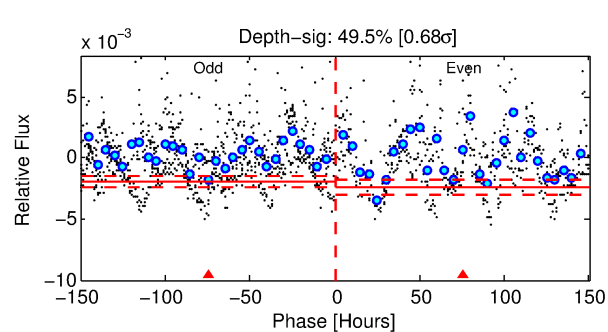
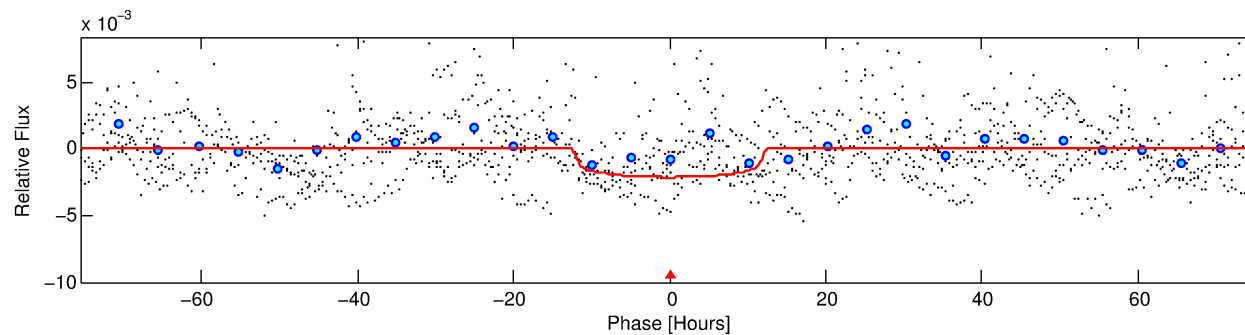
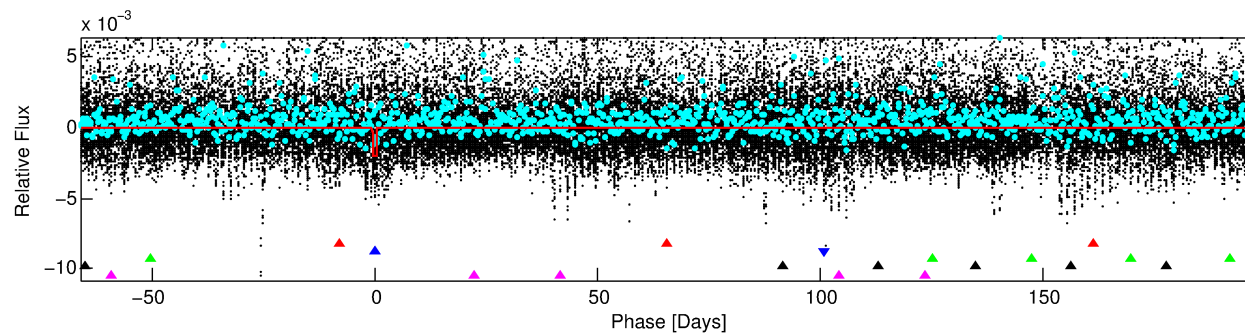
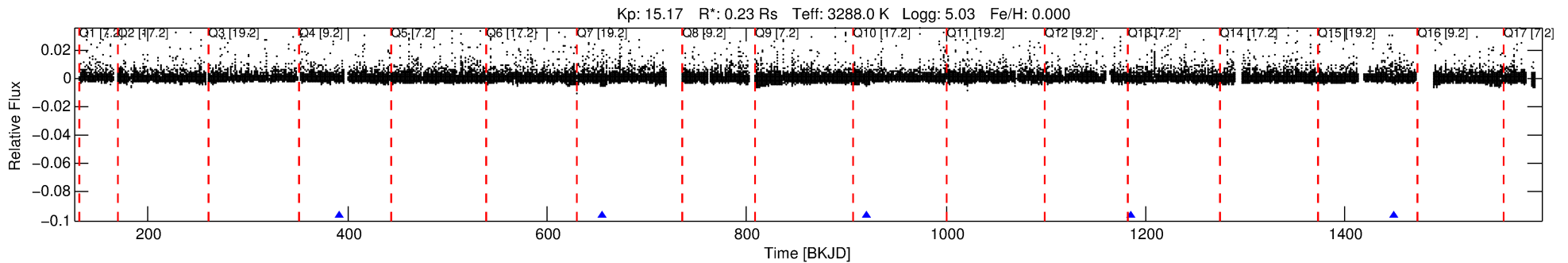
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008611876-02

No Significant Match Found

# DV One-Page Summary

KIC: 8611876 Candidate: 2 of 5 Period: 264.533 d



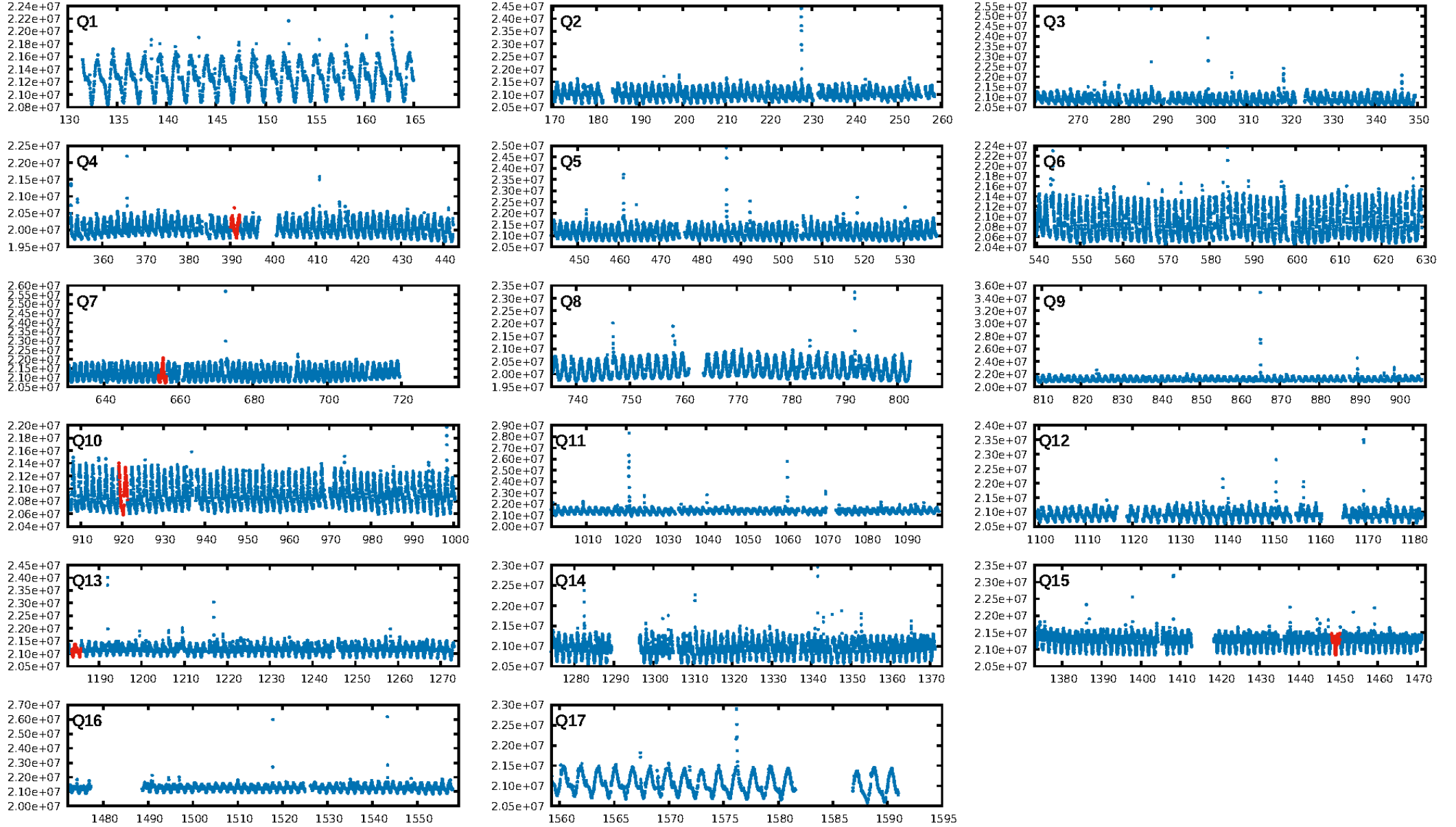
## DV Fit Results:

Period = 264.53283 [0.00872] d  
Epoch = 391.1610 [0.0202] BKJD  
Rp/R\* = 0.0420 [0.0060]  
a/R\* = 83.10 [41.63]  
b = 0.11 [4.31]  
Seff = 0.02 [0.00]  
Teq = 101 [3] K  
Rp = 1.06 [0.22] Re  
a = 0.4795 [0.0511] AU  
Ag = 256451.06 [90806.20] [2.82 $\sigma$ ]  
Teffp = 3503 [295] K [11.53 $\sigma$ ]

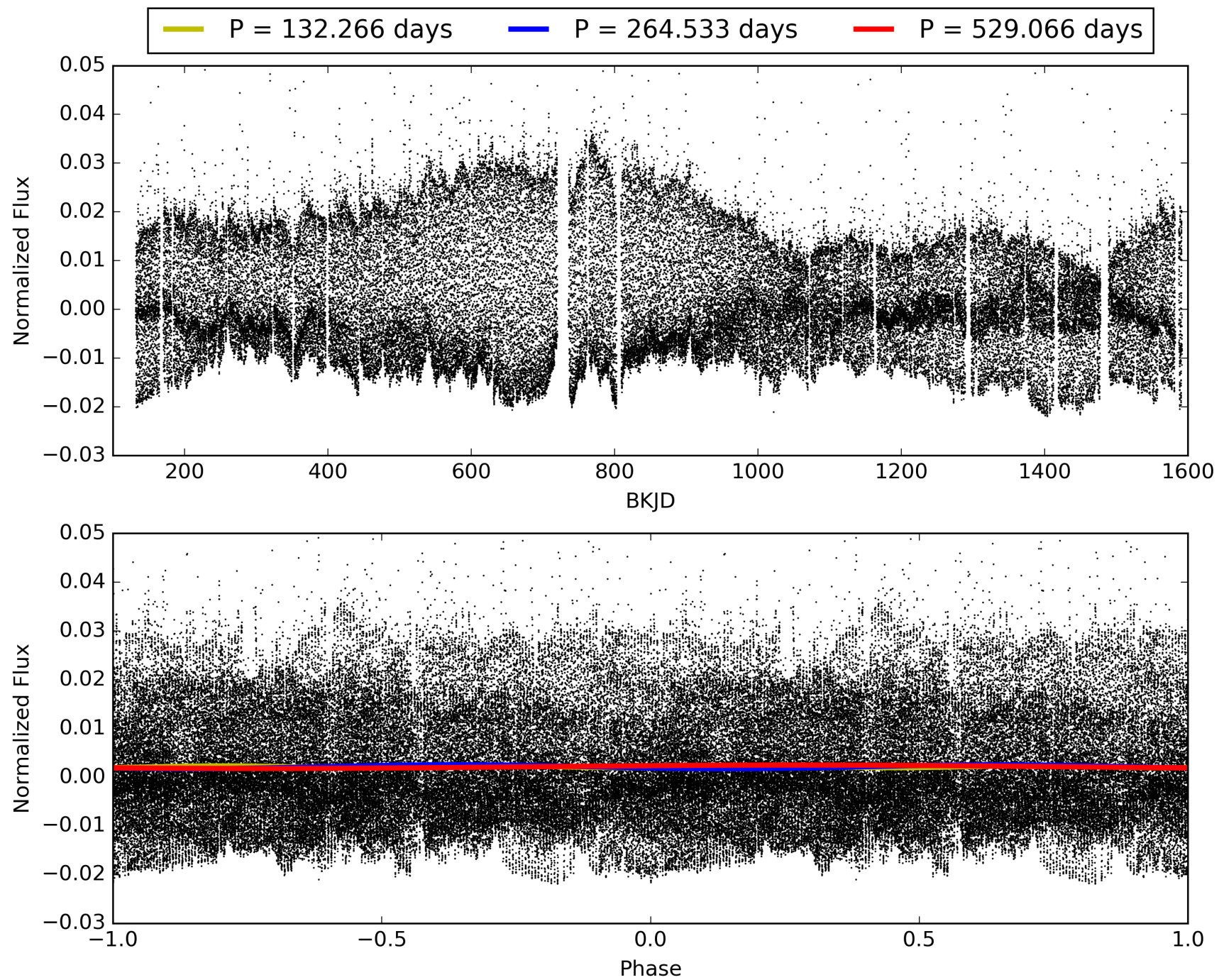
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [20.35 $\sigma$ ]  
LongPeriod-sig: 100.0% [20.46 $\sigma$ ]  
ModelChiSquare2-sig: 85.3%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 5.12e-10**  
RollingBand-fgt: 1.00 [5/5]  
**GhostDiagnostic-chr: 7.323**  
Centroid-sig: 0.1%  
Centroid-so: 0.466 arcsec [1.48 $\sigma$ ]  
OotOffset-rm: 0.124 arcsec [1.80 $\sigma$ ]  
KicOffset-rm: 0.113 arcsec [1.35 $\sigma$ ]  
OotOffset-st: 1/1/1/0 [3]  
KicOffset-st: 1/1/1/0 [3]  
DiffImageQuality-fgm: 0.67 [2/3]  
DiffImageOverlap-fno: 1.00 [3/3]

# TCE 008611876-02, PDC Light Curves

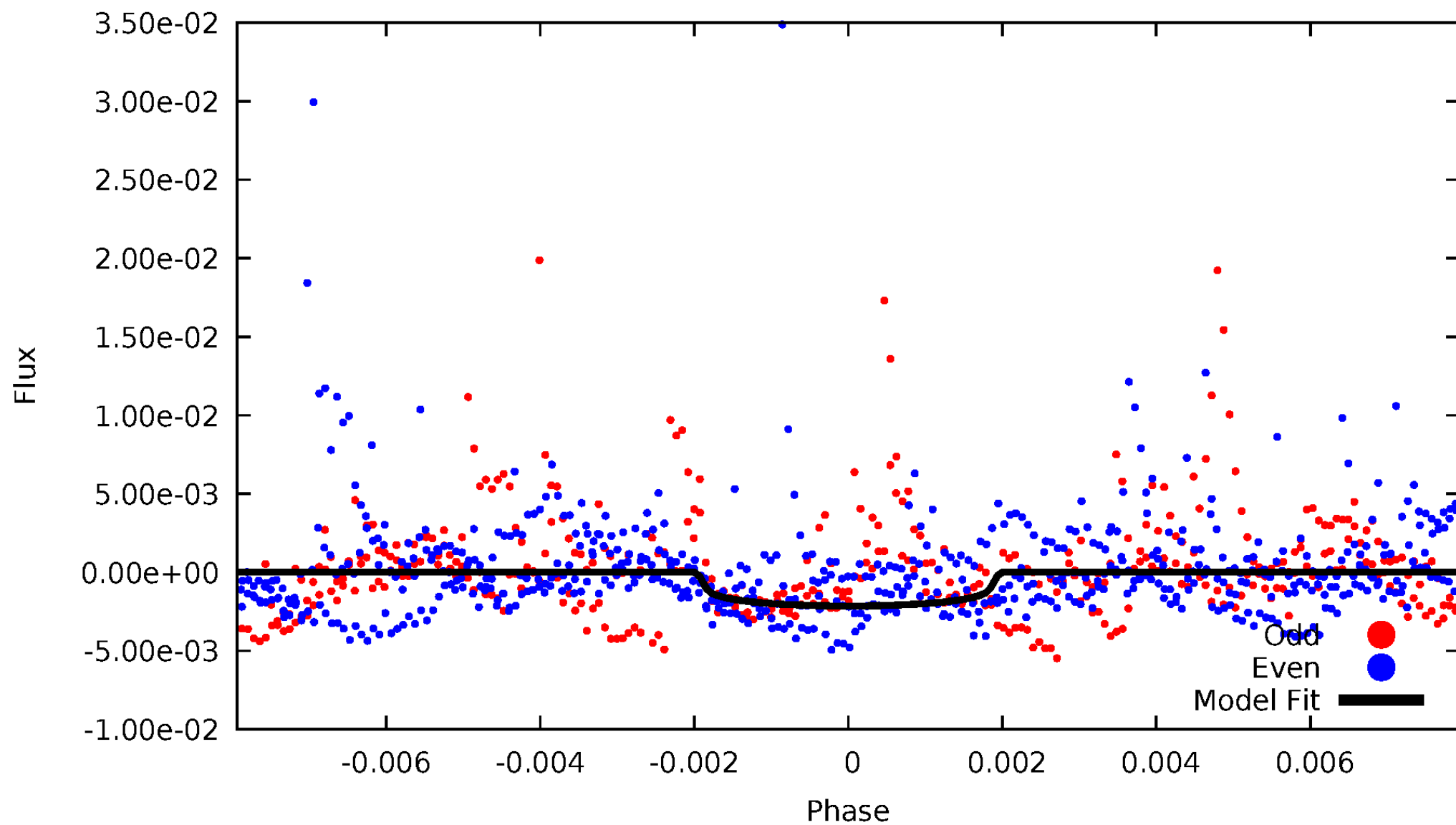


# TCE 008611876-02



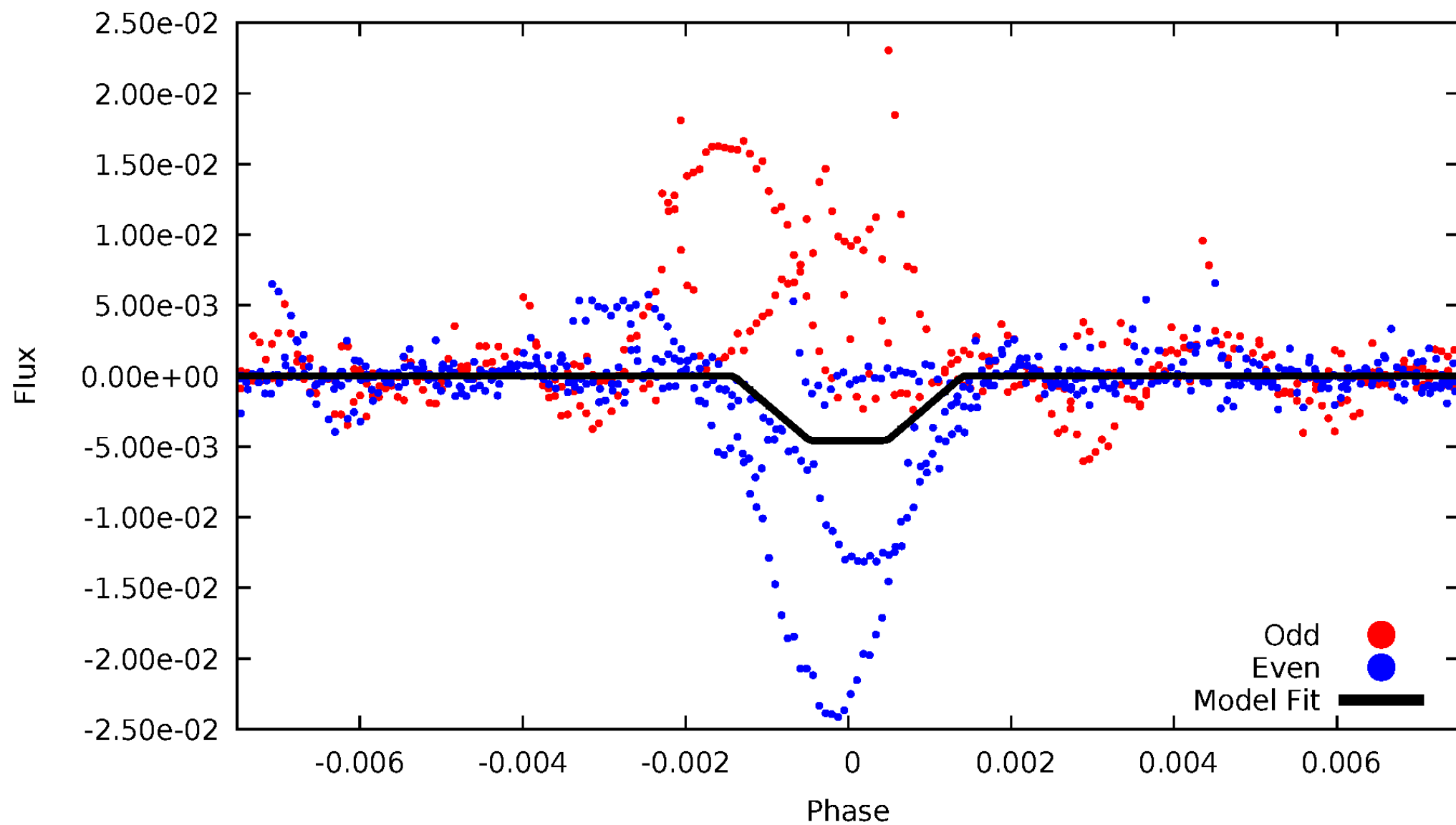
# DV Odd/Even

TCE 008611876-02



# ALT Odd/Even

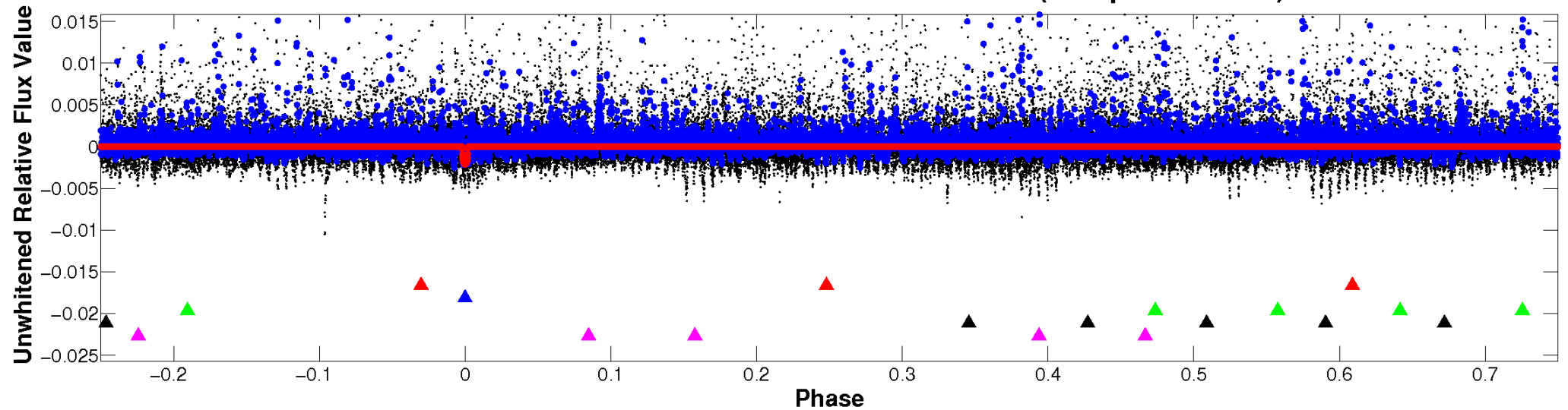
TCE 008611876-02



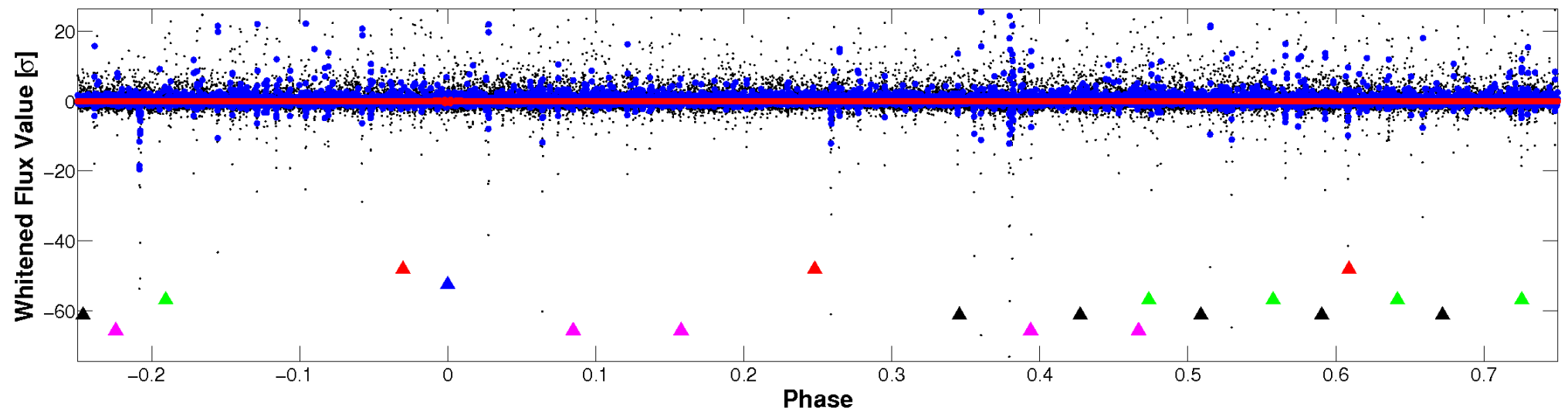


# Non-Whitened Vs. Whitened Light Curve

Planet 2 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)



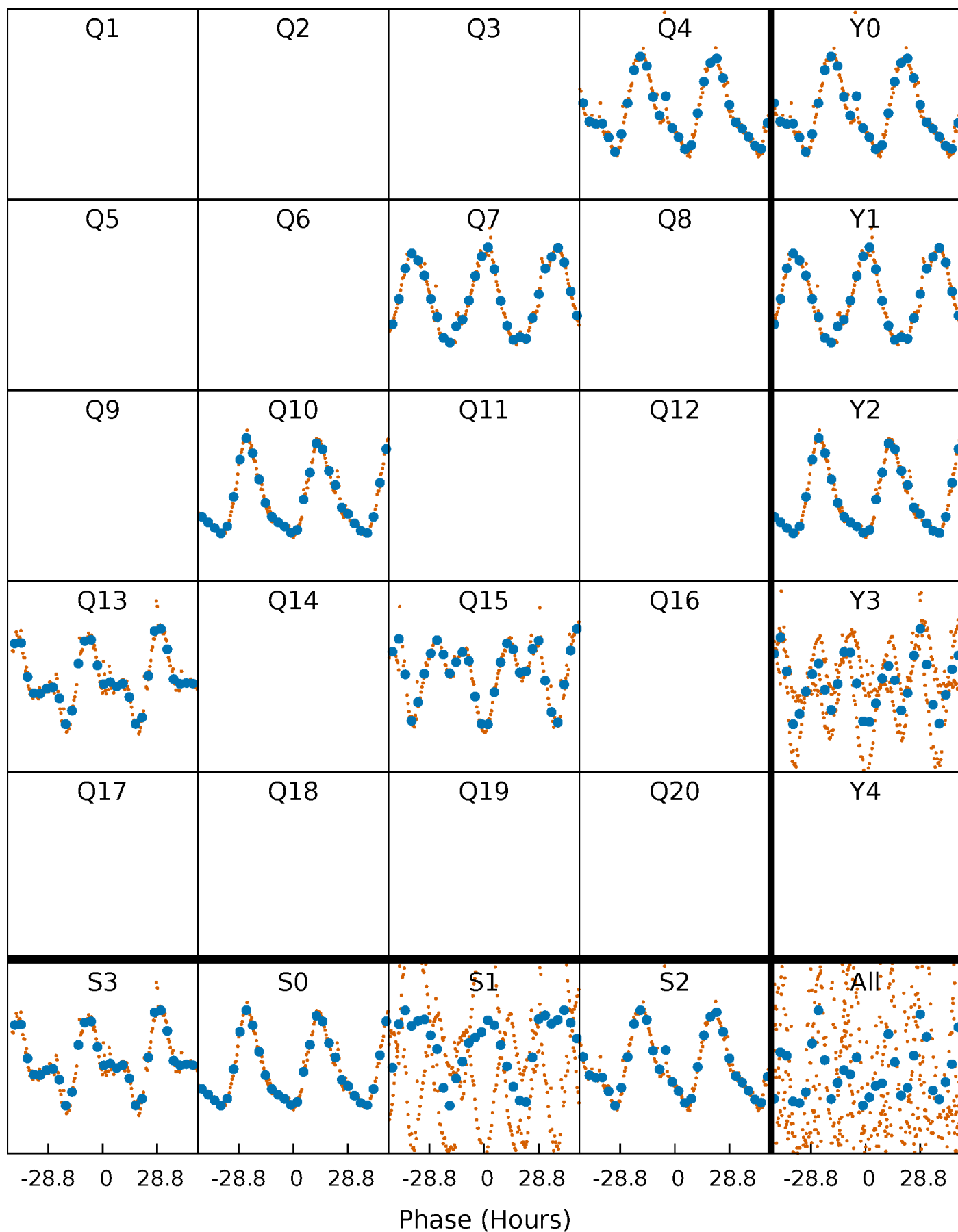
Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)





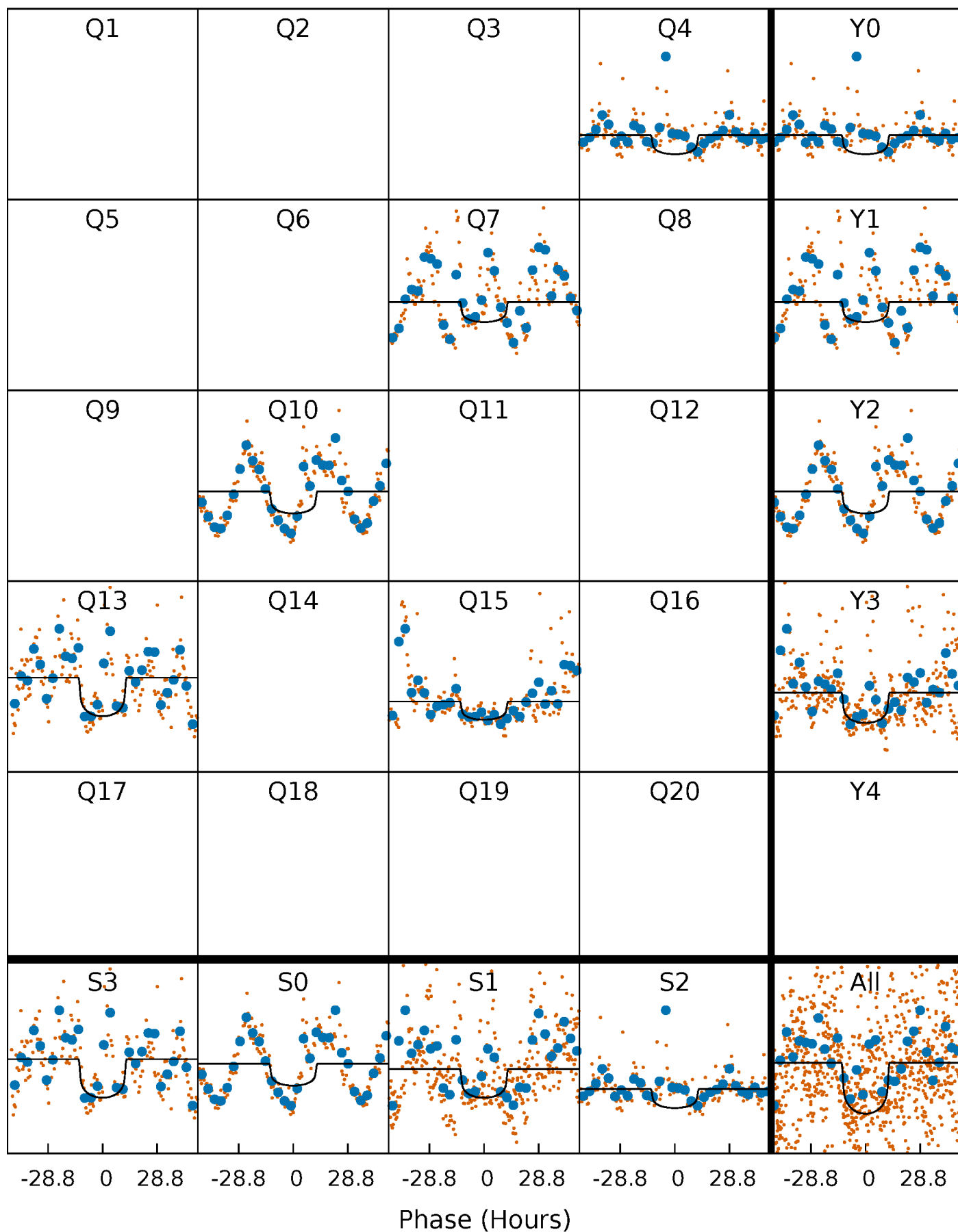
# PDC Quarter-Phased Transit Curves

TCE 008611876-02 P=264.532828 Days  $T_0=391.160973$  (BKJD)



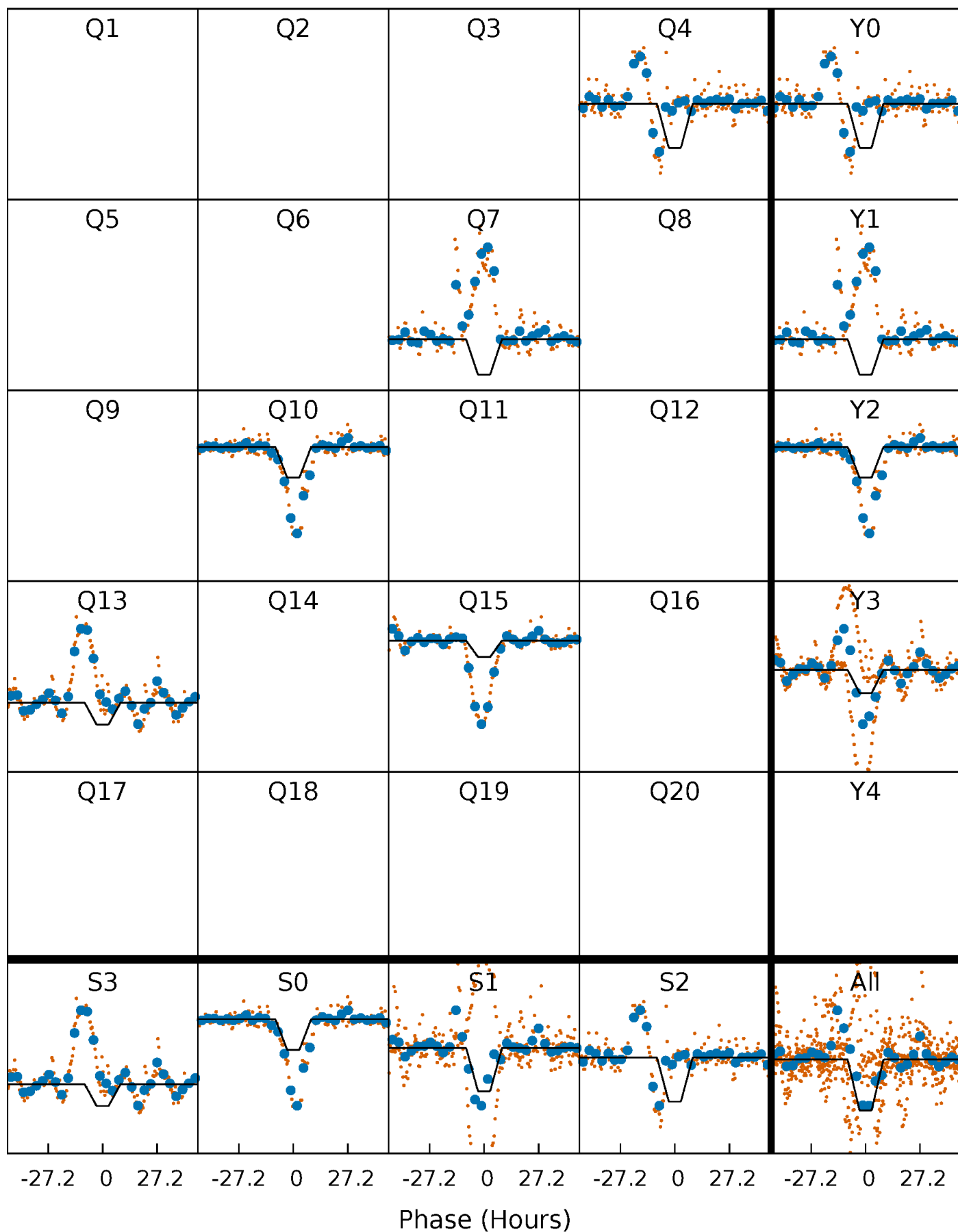
# DV Quarter-Phased Transit Curves

TCE 008611876-02     $P=264.532828$  Days     $T_0=391.160973$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

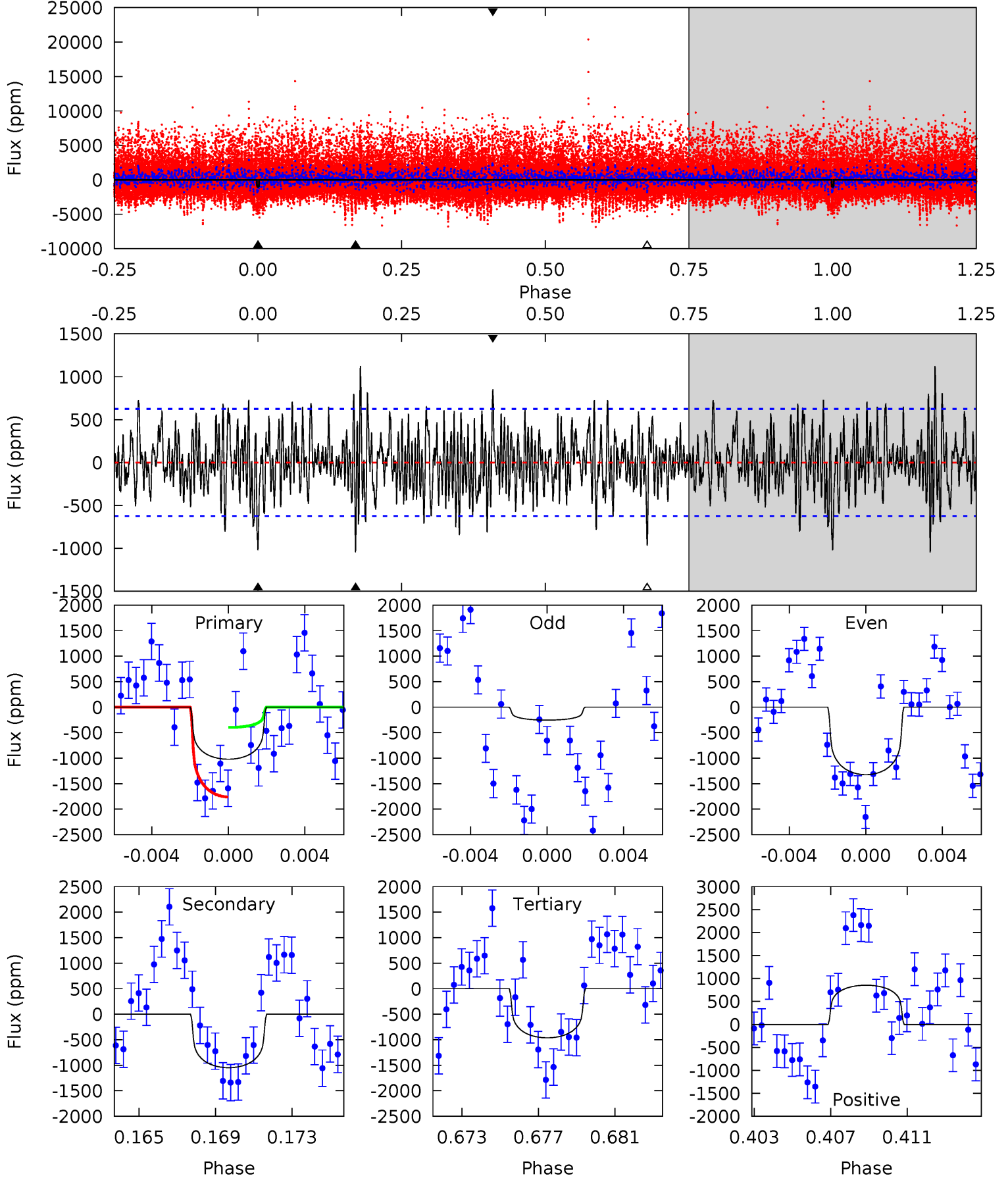
TCE 008611876-02 P=264.553301 Days  $T_0=391.134113$  (BKJD)



# DV Model-Shift Uniqueness Test

008611876-02, P = 264.532828 Days, E = 126.628145 Days

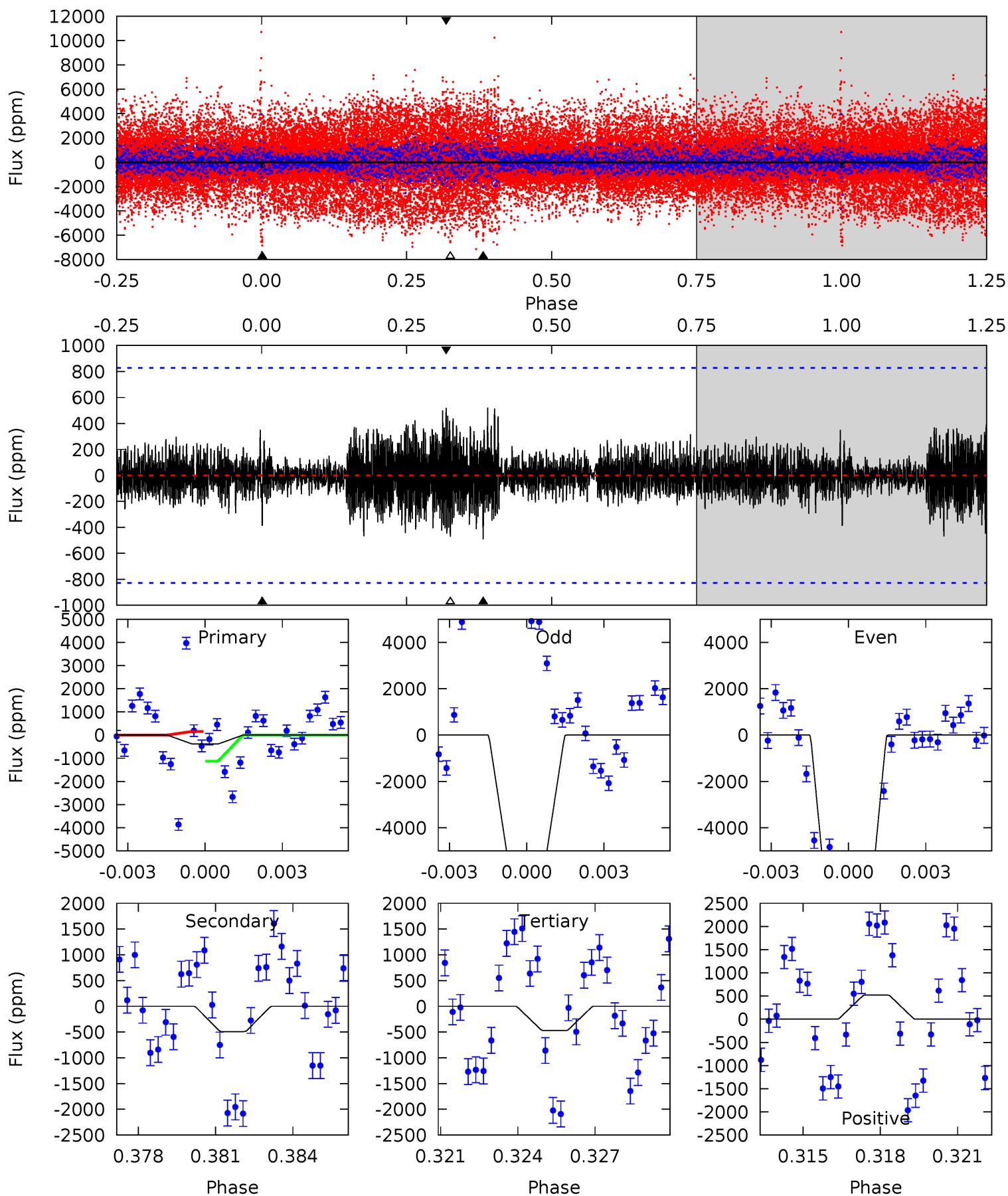
| Pri  | Sec  | Ter  | Pos  | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 8.49 | 8.72 | 8.01 | 7.10 | 5.20            | 2.88            | 2.41             | 0.48    | 1.39    | 0.71    | 1.61    | 4.03    | 0.80 | 0.52  | 5.71 |



# Alt Model-Shift Uniqueness Test

008611876-02, P = 264.553301 Days, E = 126.580812 Days

| Pri  | Sec  | Ter  | Pos  | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|-----|
| 2.47 | 3.12 | 2.99 | 3.30 | 5.26            | 2.98            | 0.89             | -0.53   | -0.84   | 0.13    | -0.18   | 15.5    | 5.54 | 0.52  | 0   |



### Stellar Parameters For KIC 008611876

|        | $T_{\text{eff}}(K)$ | $\log(g)$                 | [Fe/H]                    | $R (R_{\odot})$           | $M(M_{\odot})$            | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|---------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
|        | $3288^{+44}_{-34}$  | $5.033^{+0.044}_{-0.044}$ | $0.000^{+0.100}_{-0.100}$ | $0.231^{+0.035}_{-0.025}$ | $0.210^{+0.041}_{-0.027}$ | $23.930^{+5.802}_{-5.075}$                |
|        | +1%/-1%             | +1%/-1%                   | +inf%/-inf%               | +15%/-11%                 | +20%/-13%                 | +24%/-21%                                 |
| Source | PHO2                | PHO2                      | PHO2                      | DSEP                      |                           |   |

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 008611876-02 / KOI

| Detrend | Depth (ppm)     | $R_p (R_{\oplus})$     | $T_{max} (K)$   | $T_{obs} (K)$        | $A_{obs}$                  |
|---------|-----------------|------------------------|-----------------|----------------------|----------------------------|
| DV      | $-1048 \pm 120$ | $1.05^{+0.18}_{-0.16}$ | $141^{+4}_{-3}$ | $3062^{+140}_{-142}$ | $120100^{+44942}_{-32915}$ |
| Alt.    | $-491 \pm 157$  | $1.70^{+0.20}_{-0.20}$ | $141^{+3}_{-4}$ | $2434^{+112}_{-116}$ | $21280^{+8726}_{-7415}$    |

$T_{max}$  = Theoretical Maximum Planetary Temperature

$T_{obs}$  = Observed Planetary Temperature (Assuming A=0.3)

$A_{obs}$  = Observed Albedo (Assuming T=0)

If a secondary eclipse is present, the system is likely an EB if  $T_{obs} \gg T_{max}$  AND  $A_{obs} \gg 1.0$

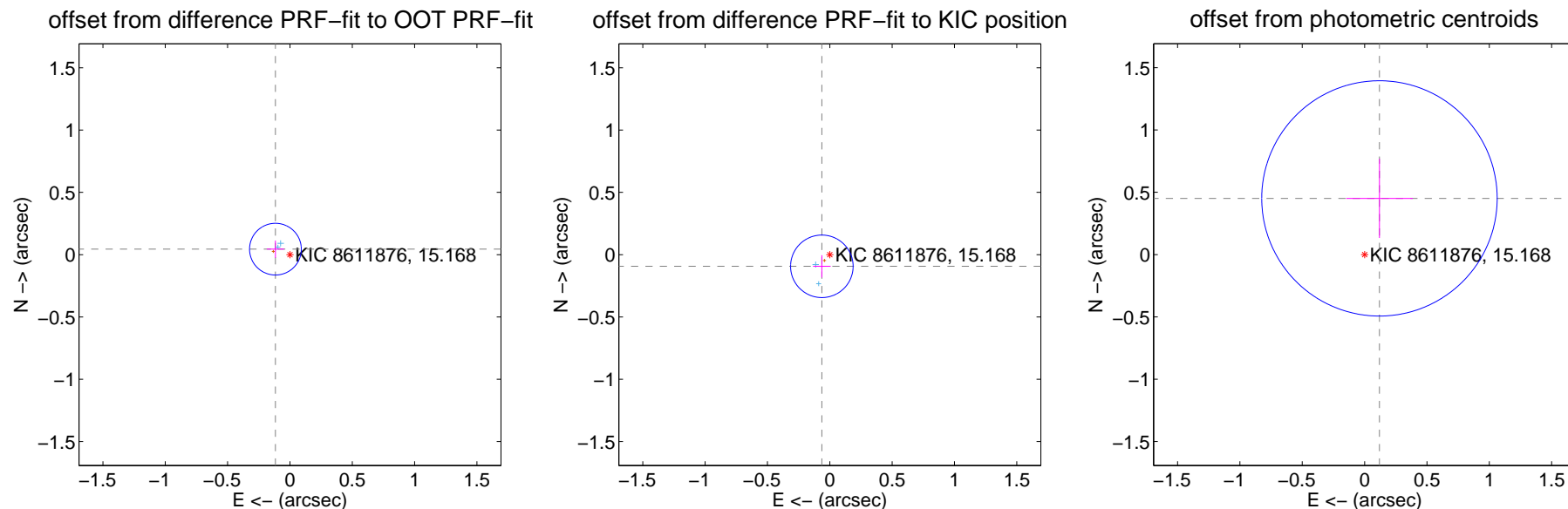
## DV Centroid Data

Supplemental centroid analysis for 008611876-02. Kepler magnitude: 15.17. Transit SNR 7.28

There are 2 quarters with good PRF difference image offsets

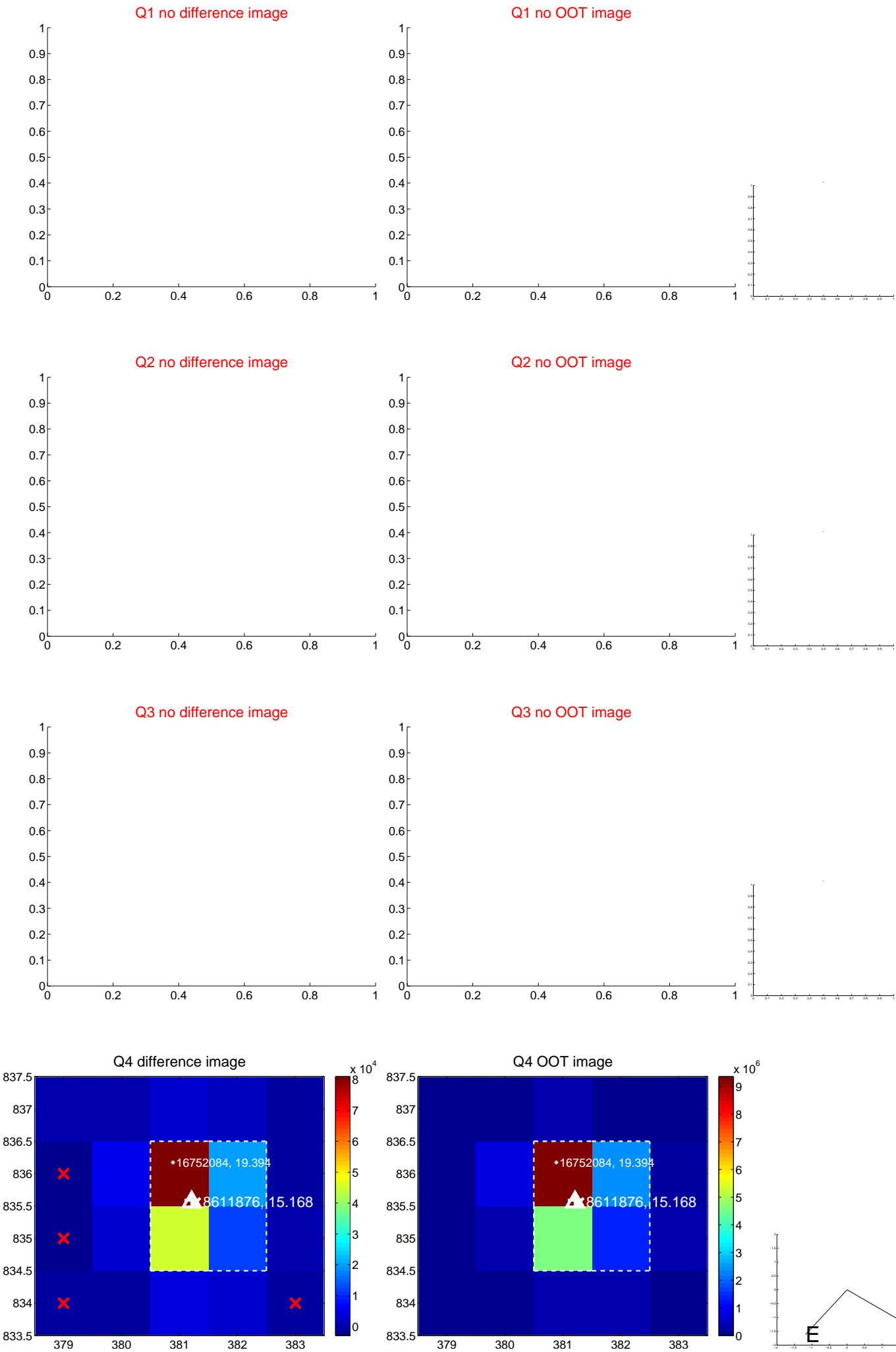
The direct PRF centroid is offset from the target star catalog position by about 0.17 arcsec

|   | Distance in arcsec | Distance / $\sigma$ | $\Delta$ RA       | $\Delta$ Dec       |
|---|--------------------|---------------------|-------------------|--------------------|
| PRF-fit source offset from OOT          | $0.124 \pm 0.069$  | 1.80                | $0.116 \pm 0.069$ | $0.044 \pm 0.069$  |
| PRF-fit source offset from KIC position | $0.113 \pm 0.084$  | 1.35                | $0.064 \pm 0.071$ | $-0.094 \pm 0.089$ |
| photometric centroid source offset      | $0.47 \pm 0.31$    | 1.48                | $-0.12 \pm 0.27$  | $0.45 \pm 0.32$    |



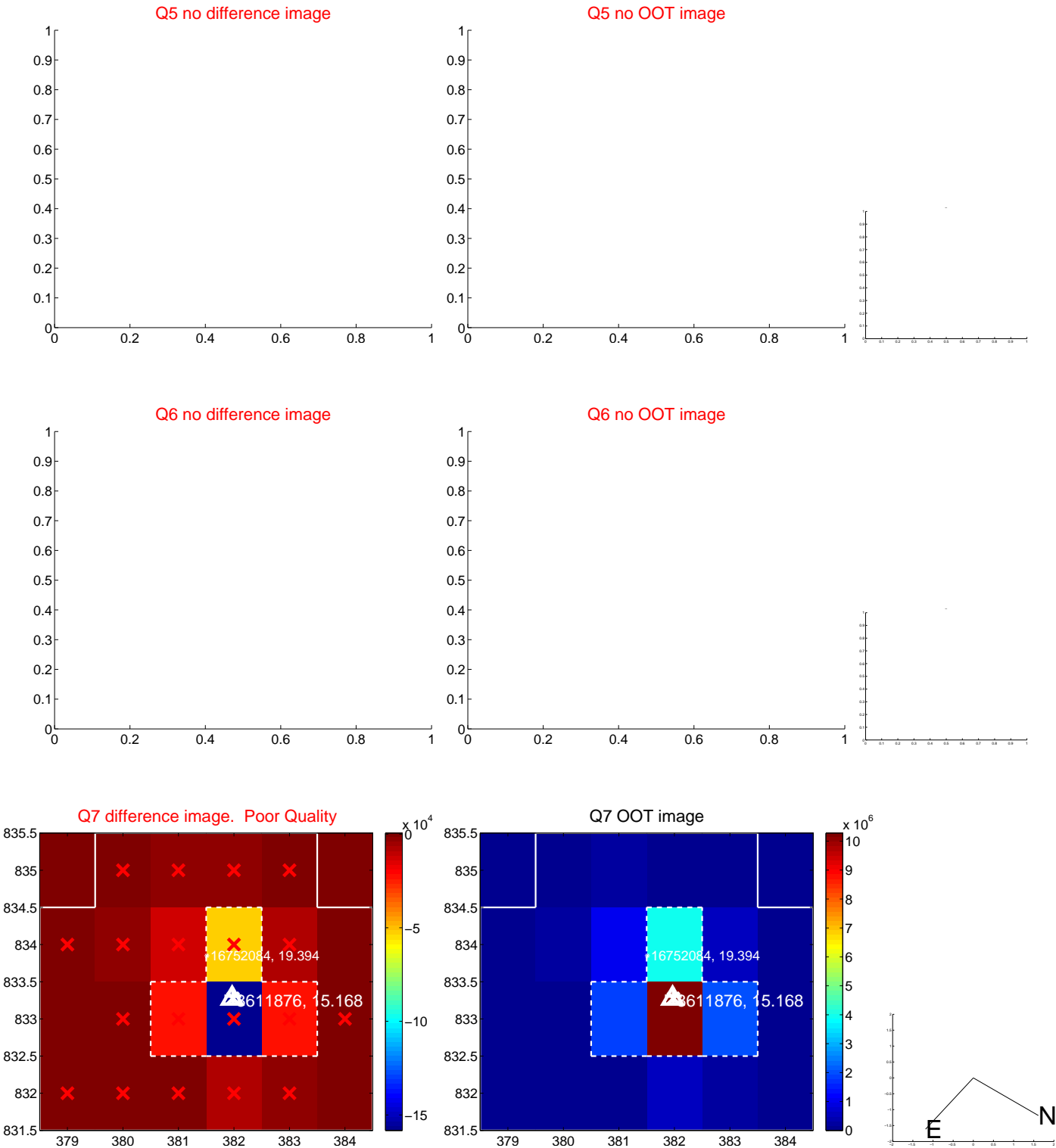
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

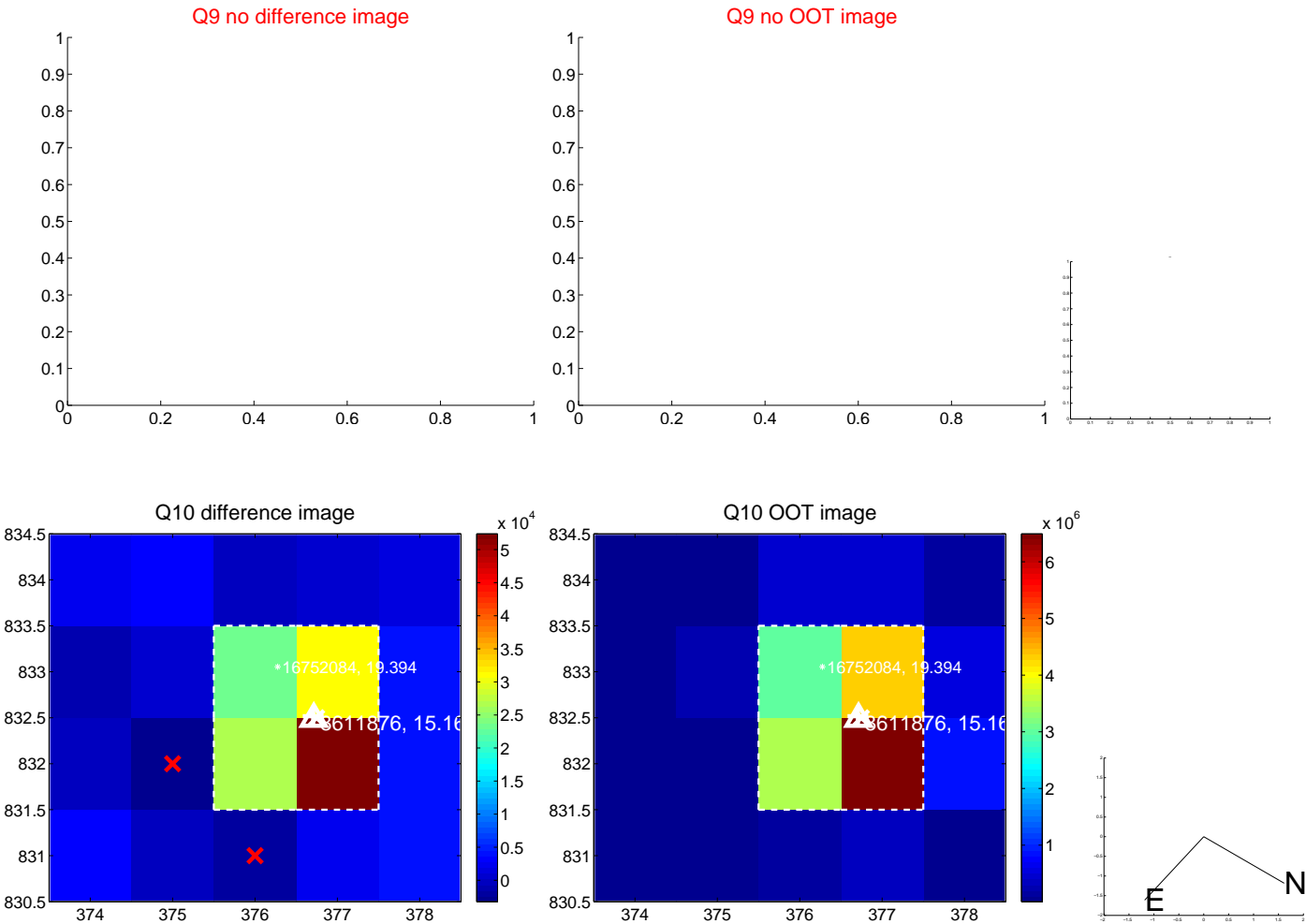




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



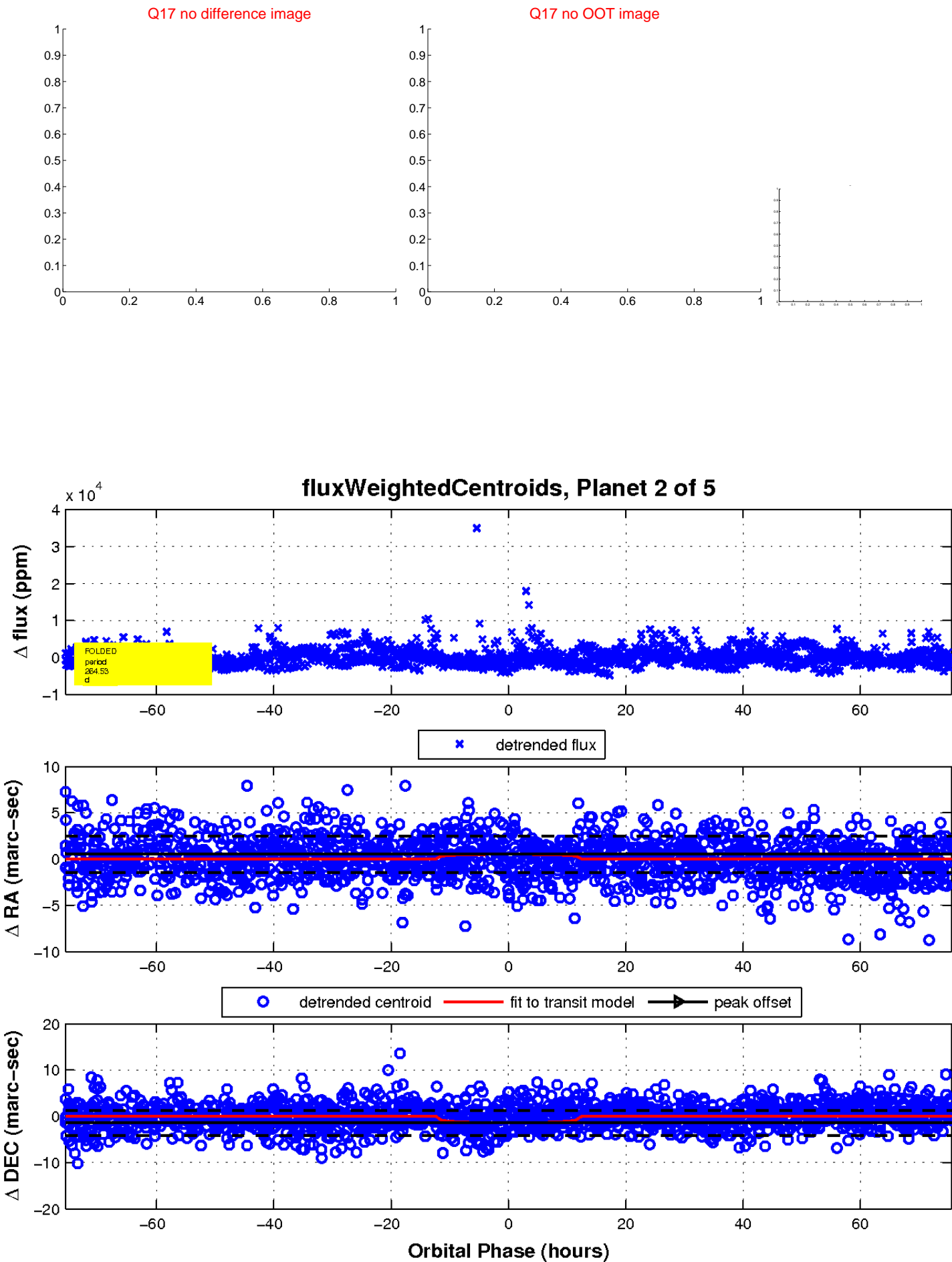
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

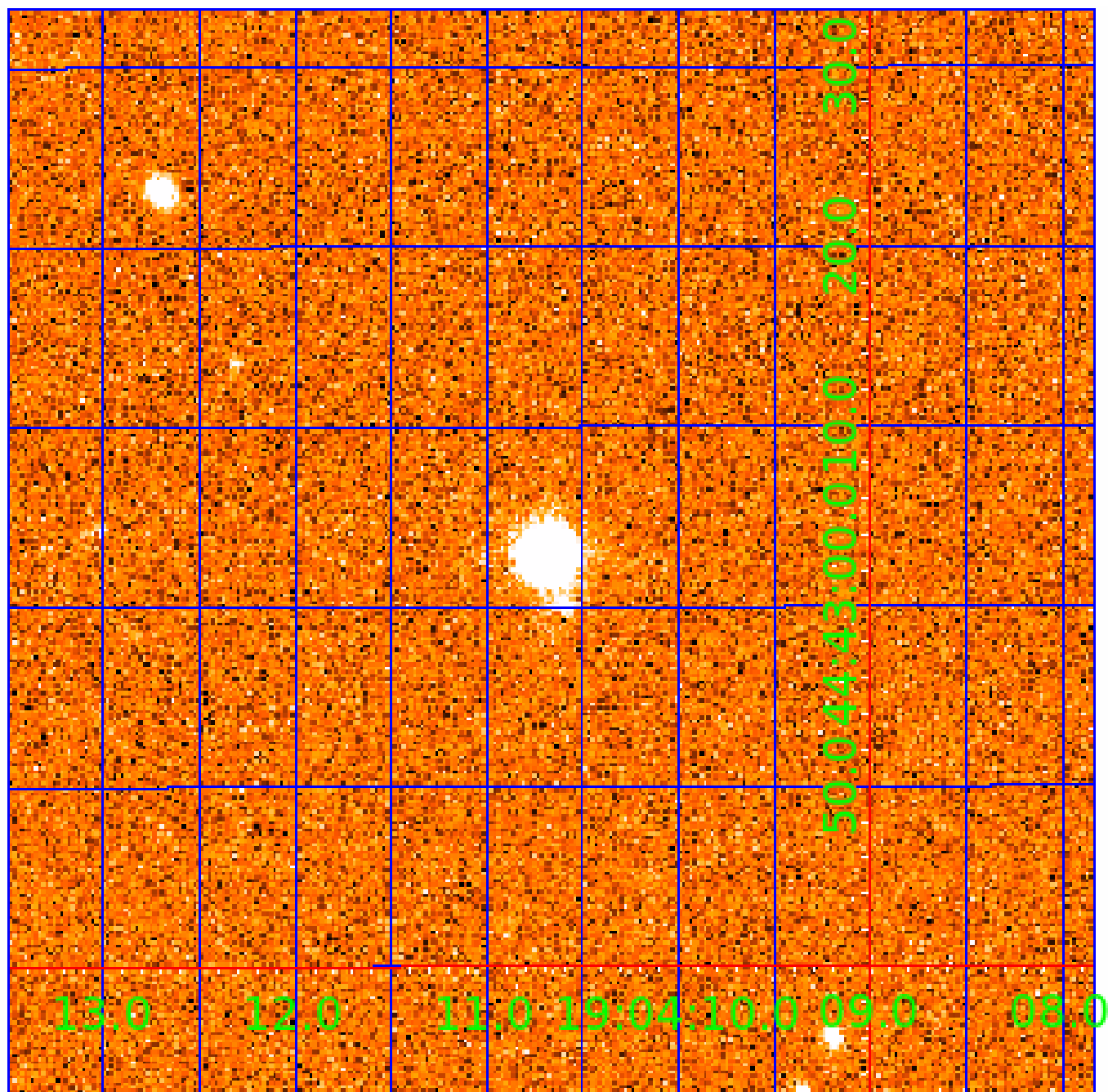


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



# UKIRT Image

Declination



# KIC 008611876

## Q1-17 DR25 TCE Parameters

| TCE          | Run Type | KOI? | Period (Days) | Epoch (BKJD) | Depth (ppm) | Duration (Hours) | MES  | SNR | $R_{\star}$ ( $R_{\odot}$ ) | $T_{\star}$ (K) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|-----|-----------------------------|-----------------|------------------------|------------------------|
| 008611876-01 | OBS      | No   | 624.538021    | 192.227622   | 3450.8      | 4.206            | 13.1 | 7.1 | 0.23                        | 3288            | 1.59                   | 0.01                   |
| 008611876-02 | OBS      | No   | 264.532828    | 391.160973   | 2149.1      | 25.185           | 9.5  | 7.3 | 0.23                        | 3288            | 1.06                   | 0.02                   |
| 008611876-03 | OBS      | No   | 286.745126    | 251.930746   | 3239.9      | 6.687            | 11.7 | 6.6 | 0.23                        | 3288            | 1.30                   | 0.02                   |
| 008611876-04 | OBS      | No   | 242.948585    | 325.990640   | 2444.9      | 3.689            | 11.3 | 7.4 | 0.23                        | 3288            | 1.13                   | 0.03                   |
| 008611876-05 | OBS      | No   | 346.285635    | 168.337816   | 1354.2      | 7.906            | 10.4 | 3.1 | 0.23                        | 3288            | 0.93                   | 0.02                   |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments  |
|--------------|----------|------|-------|---|---|---|---|---|
| 008611876-01 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS |
| 008611876-02 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS                             |
| 008611876-03 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT   |
| 008611876-04 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT   |
| 008611876-05 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS     |

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

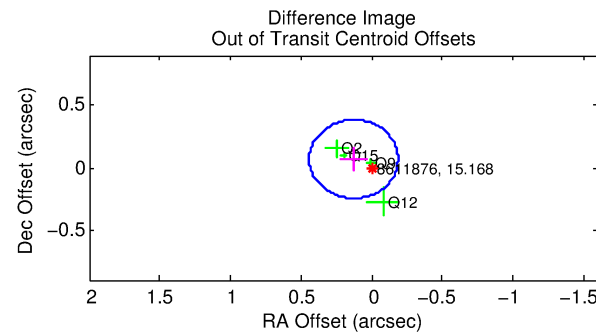
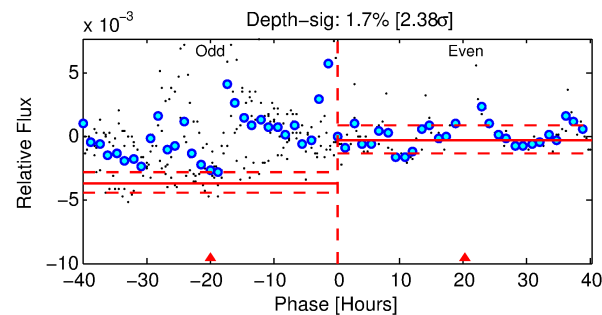
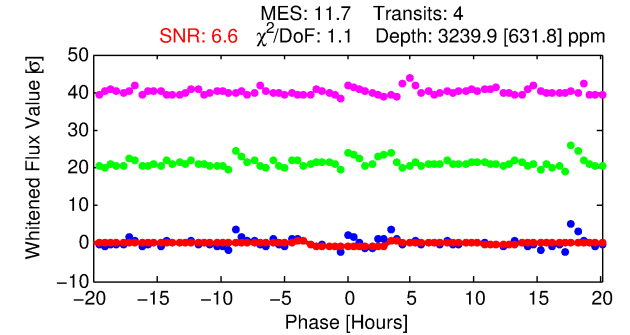
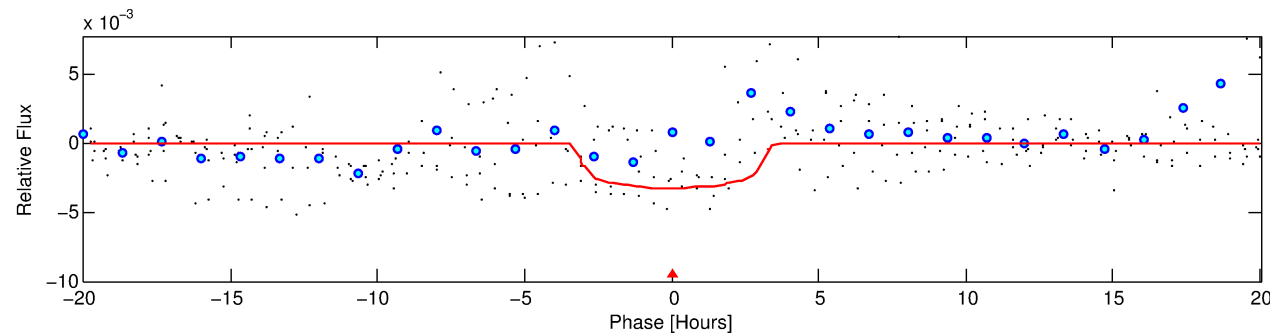
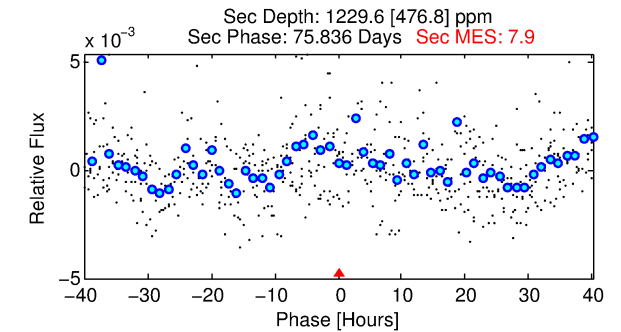
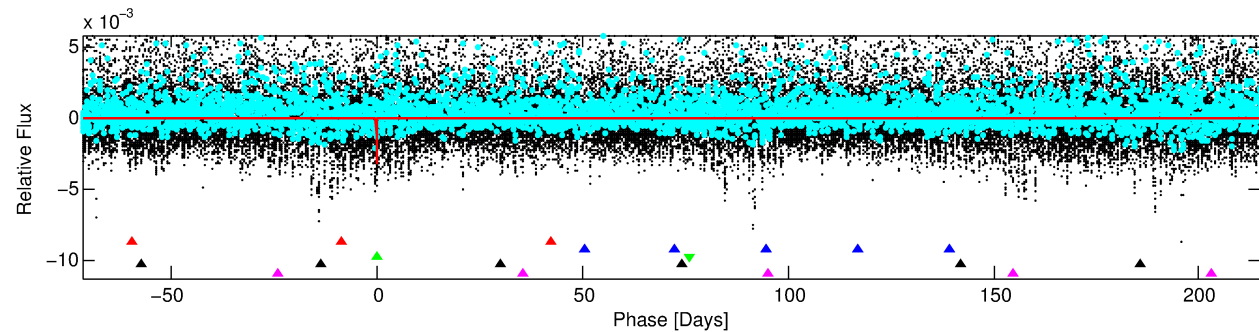
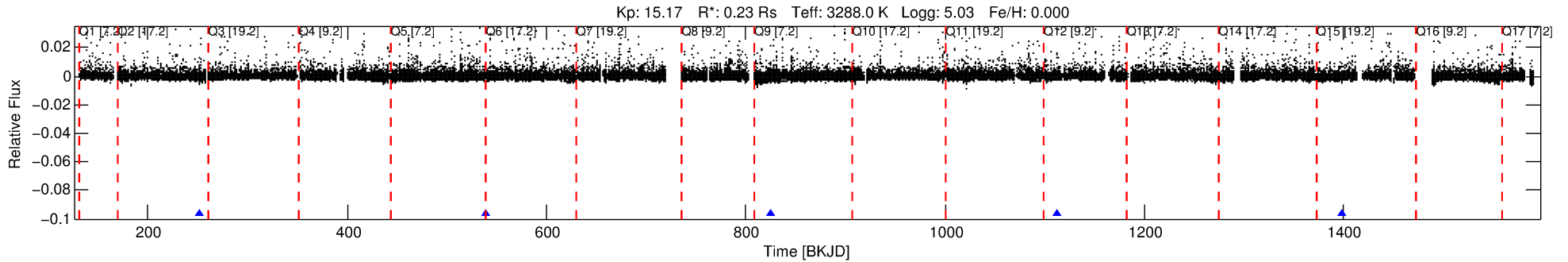
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 008611876-03

No Significant Match Found

# DV One-Page Summary

KIC: 8611876 Candidate: 3 of 5 Period: 286.745 d



## DV Fit Results:

Period = 286.74513 [0.00378] d  
Epoch = 251.9307 [0.0118] BKJD  
Rp/R\* = 0.0515 [0.0293]  
a/R\* = 344.38 [805.41]  
b = 0.02 [127.27]  
Seff = 0.02 [0.00]  
Teq = 98 [3] K  
Rp = 1.30 [0.76] Re  
a = 0.5059 [0.0539] AU  
Ag = 102939.77 [124384.16] [0.83σ]  
**Teffp = 2714 [817] K [3.20σ]**

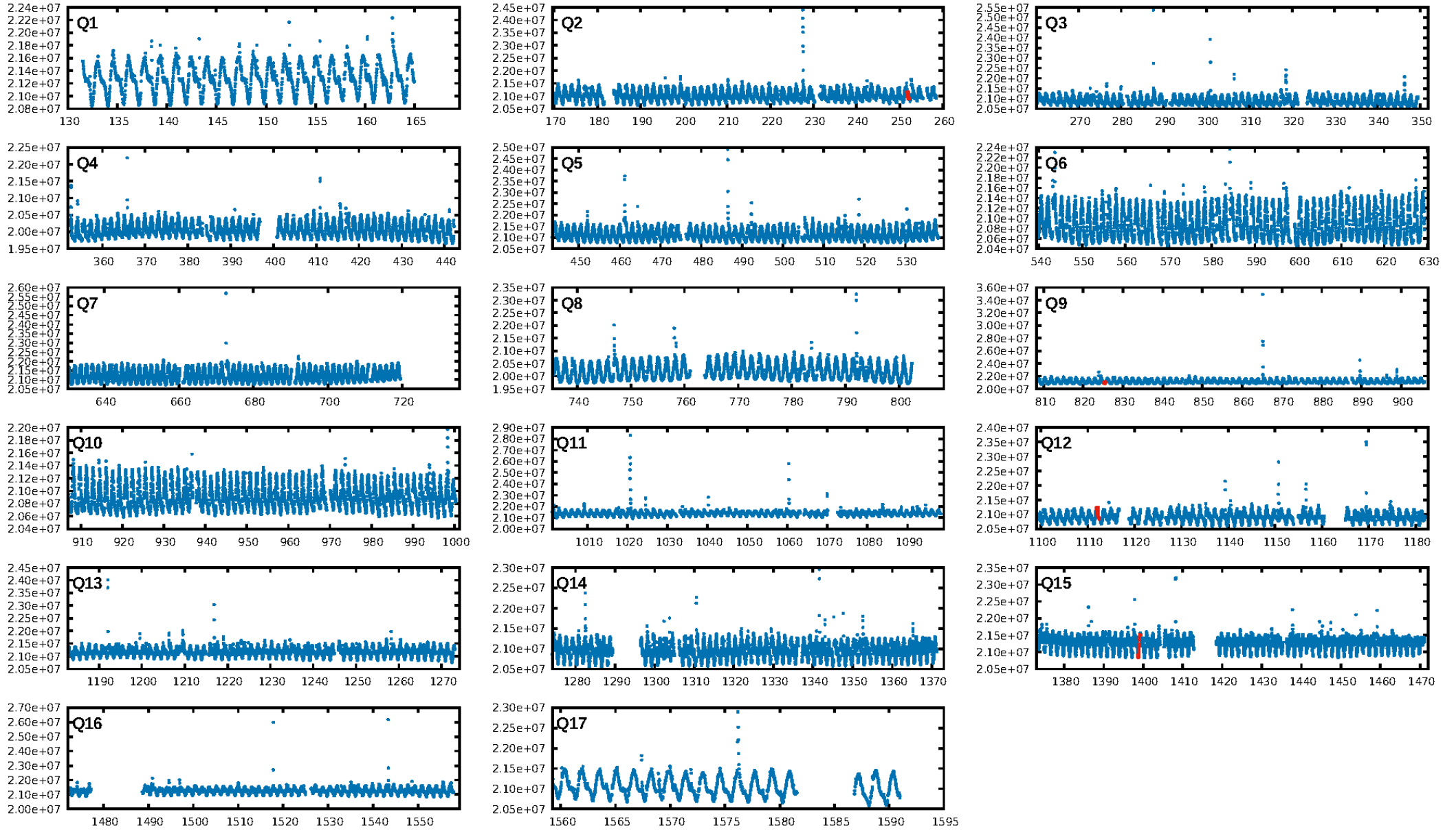
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [20.46σ]  
LongPeriod-sig: 100.0% [138.00σ]  
ModelChiSquare2-sig: 12.1%  
ModelChiSquareGof-sig: 99.6%  
**Bootstrap-pfa: 1.00e-09**  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: 1.153  
Centroid-sig: 8.2%  
Centroid-so: 0.664 arcsec [1.77σ]  
OotOffset-rm: 0.146 arcsec [1.40σ]  
KicOffset-rm: 0.167 arcsec [1.78σ]  
OotOffset-st: 1/1/1/1 [4]  
KicOffset-st: 1/1/1/1 [4]  
DiffImageQuality-fgm: 0.75 [3/4]  
DiffImageOverlap-fno: 1.00 [4/4]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 05:48:51 Z

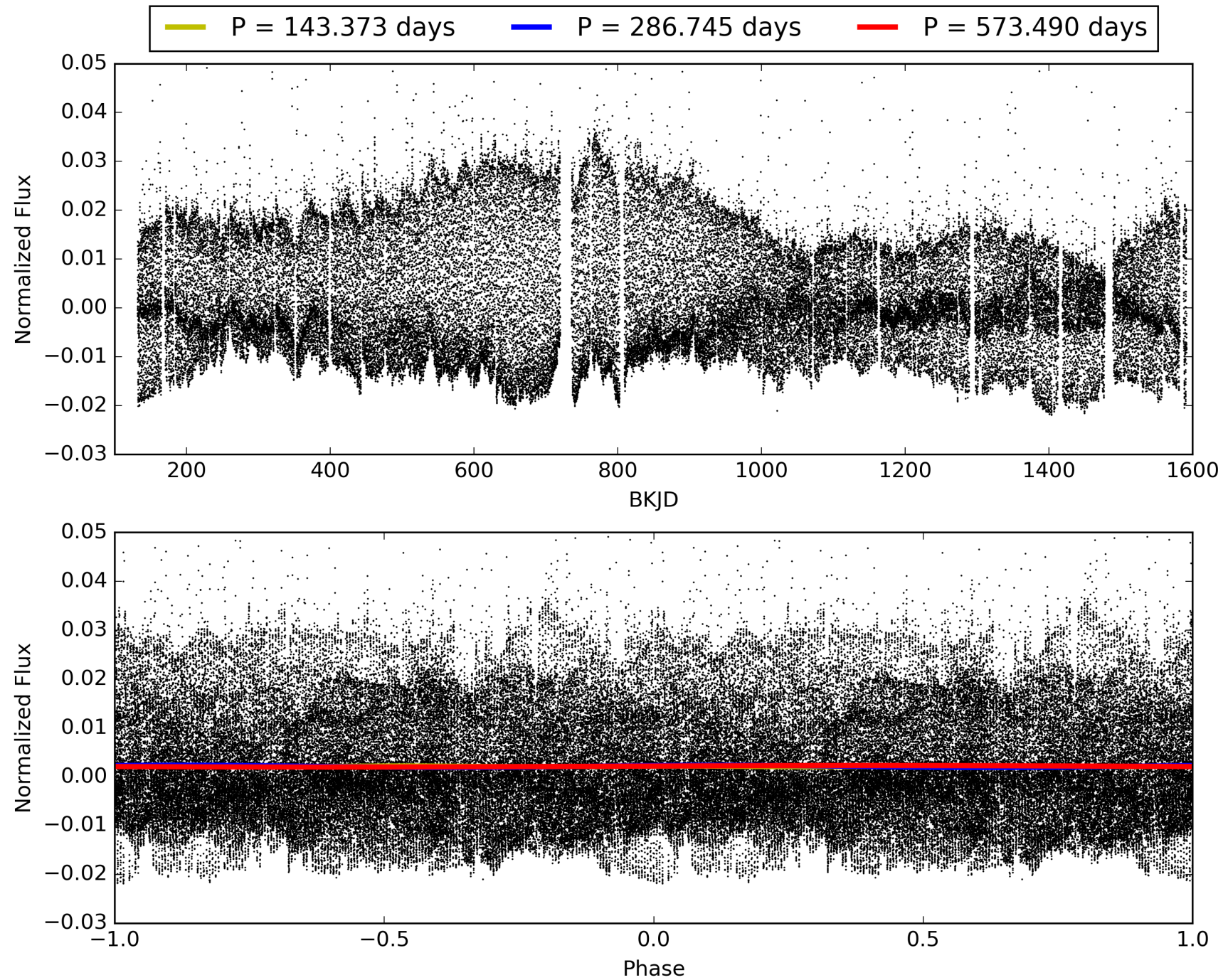
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 008611876-03, PDC Light Curves



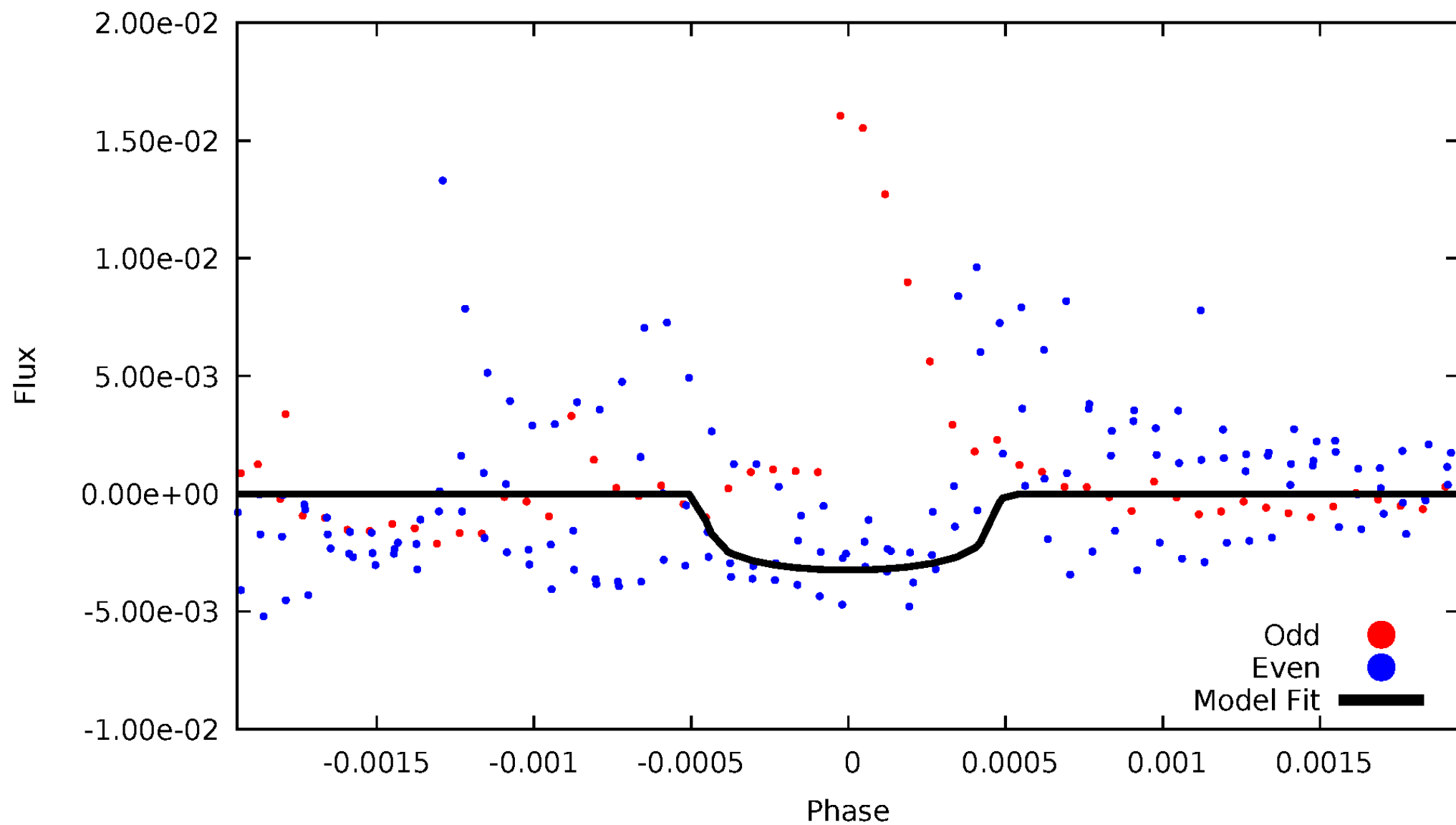


# TCE 008611876-03



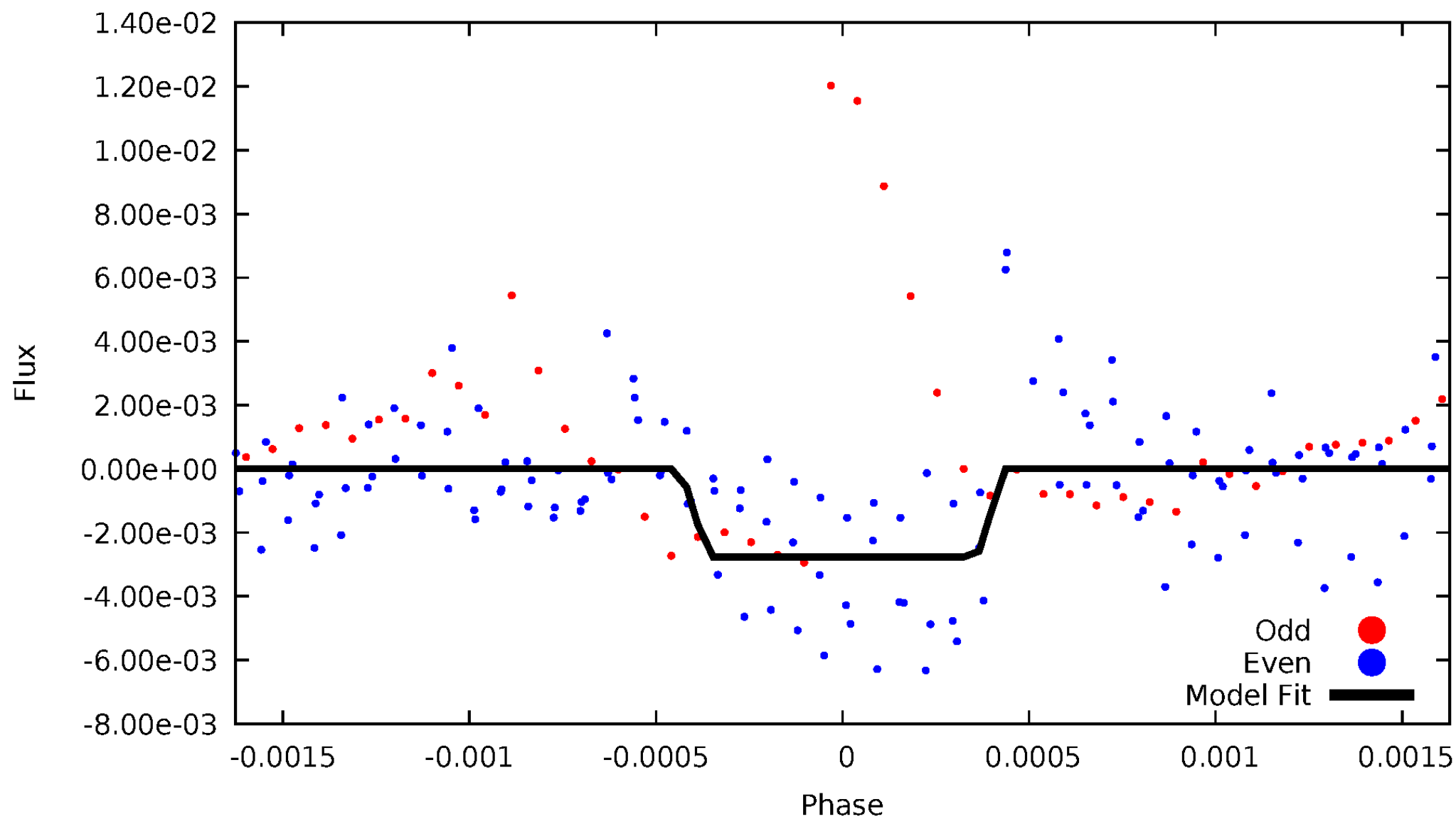
# DV Odd/Even

TCE 008611876-03



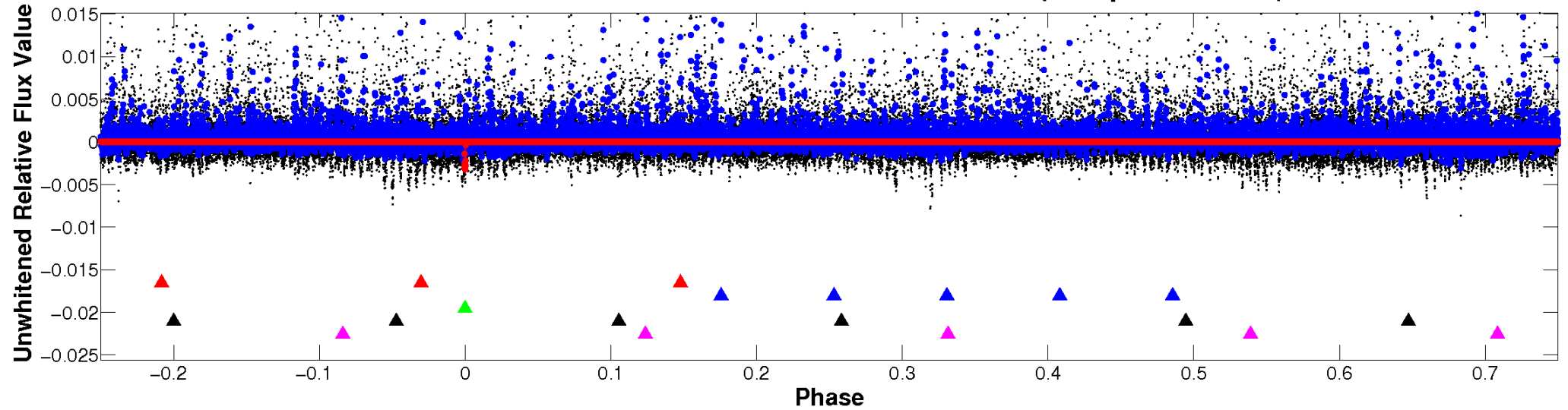
# ALT Odd/Even

TCE 008611876-03

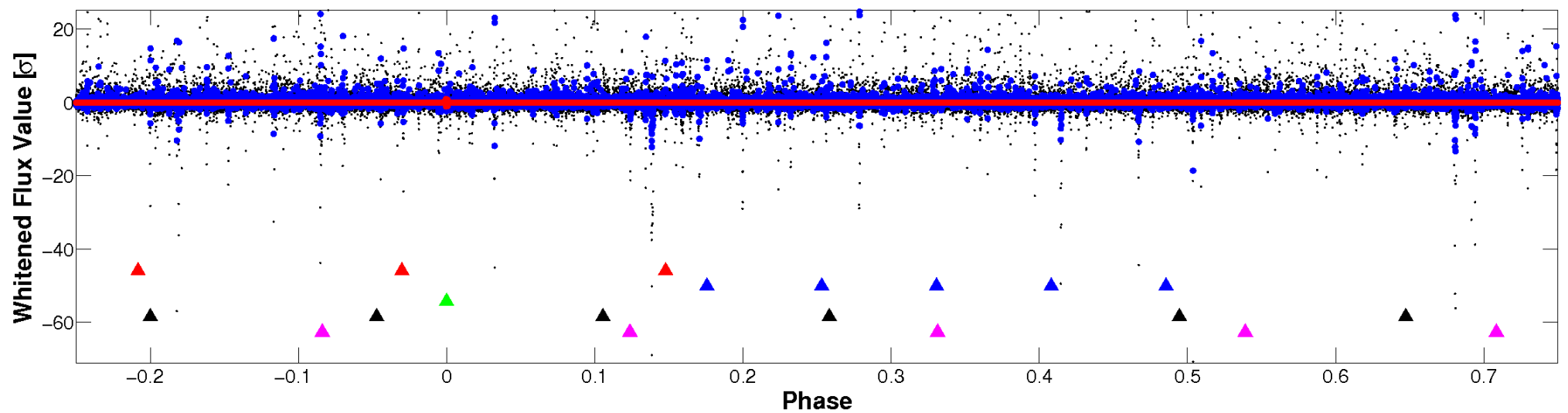


# Non-Whitened Vs. Whitened Light Curve

Planet 3 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

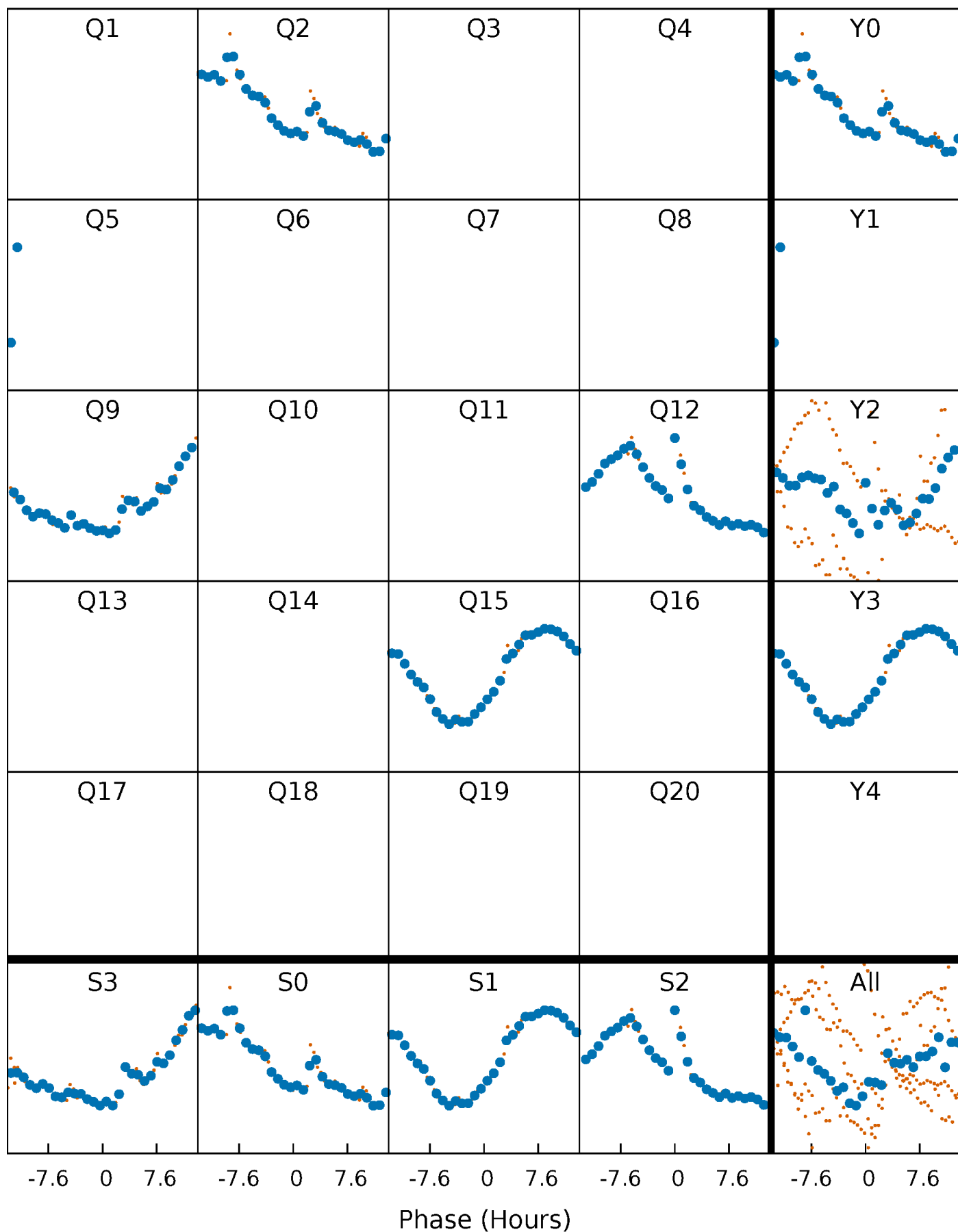


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



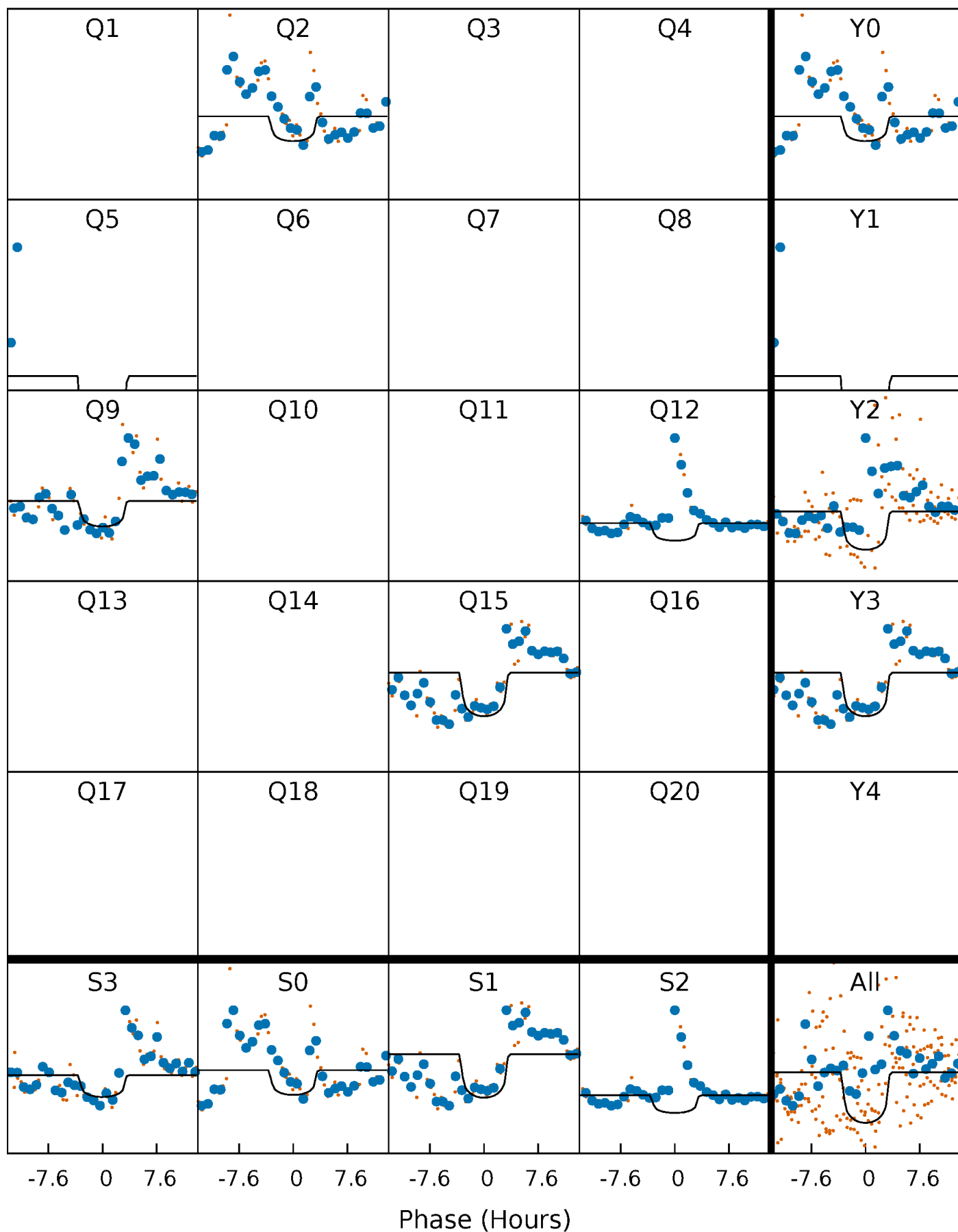
# PDC Quarter-Phased Transit Curves

TCE 008611876-03 P=286.745126 Days  $T_0=251.930746$  (BKJD)



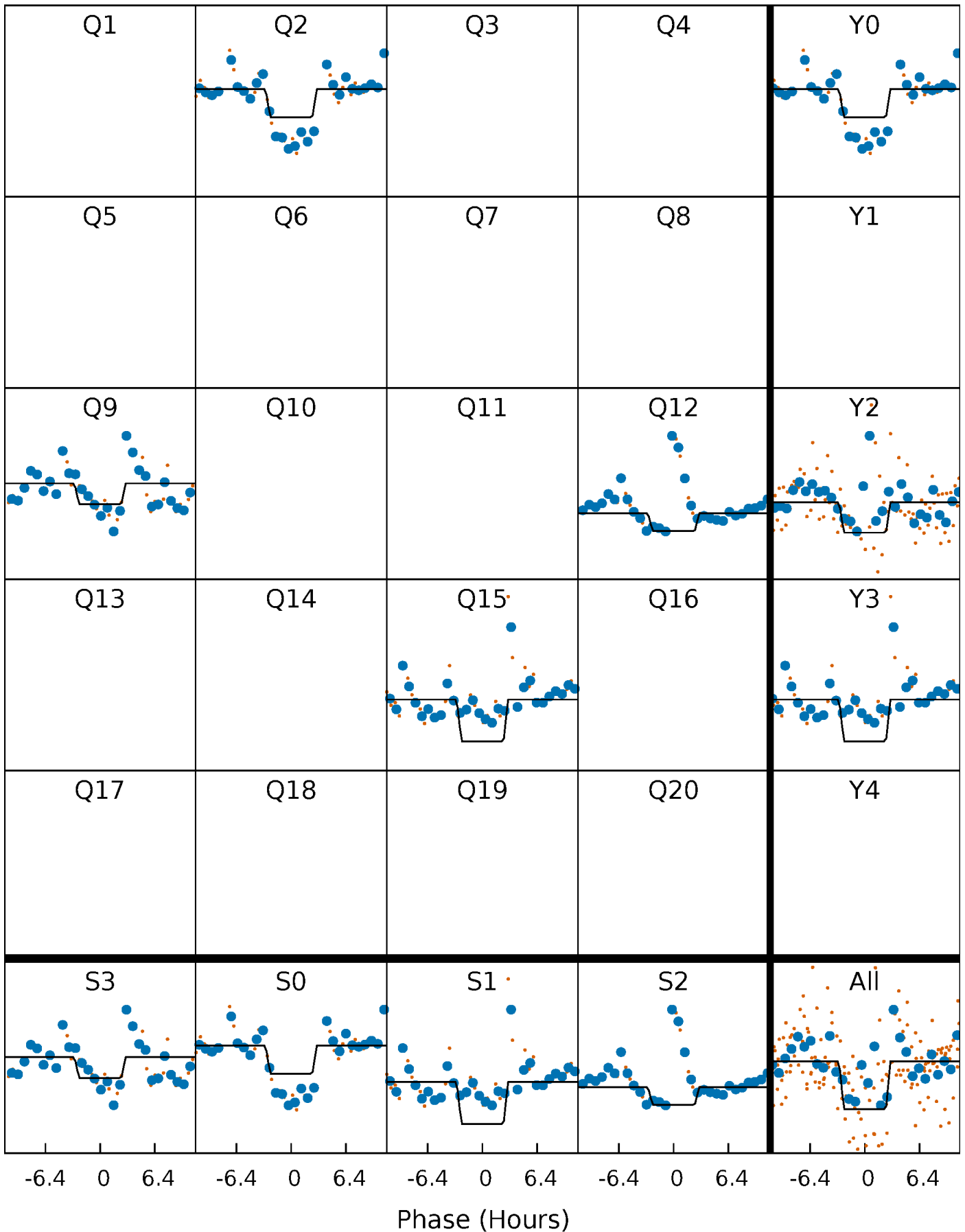
# DV Quarter-Phased Transit Curves

TCE 008611876-03     $P=286.745126$  Days     $T_0=251.930746$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

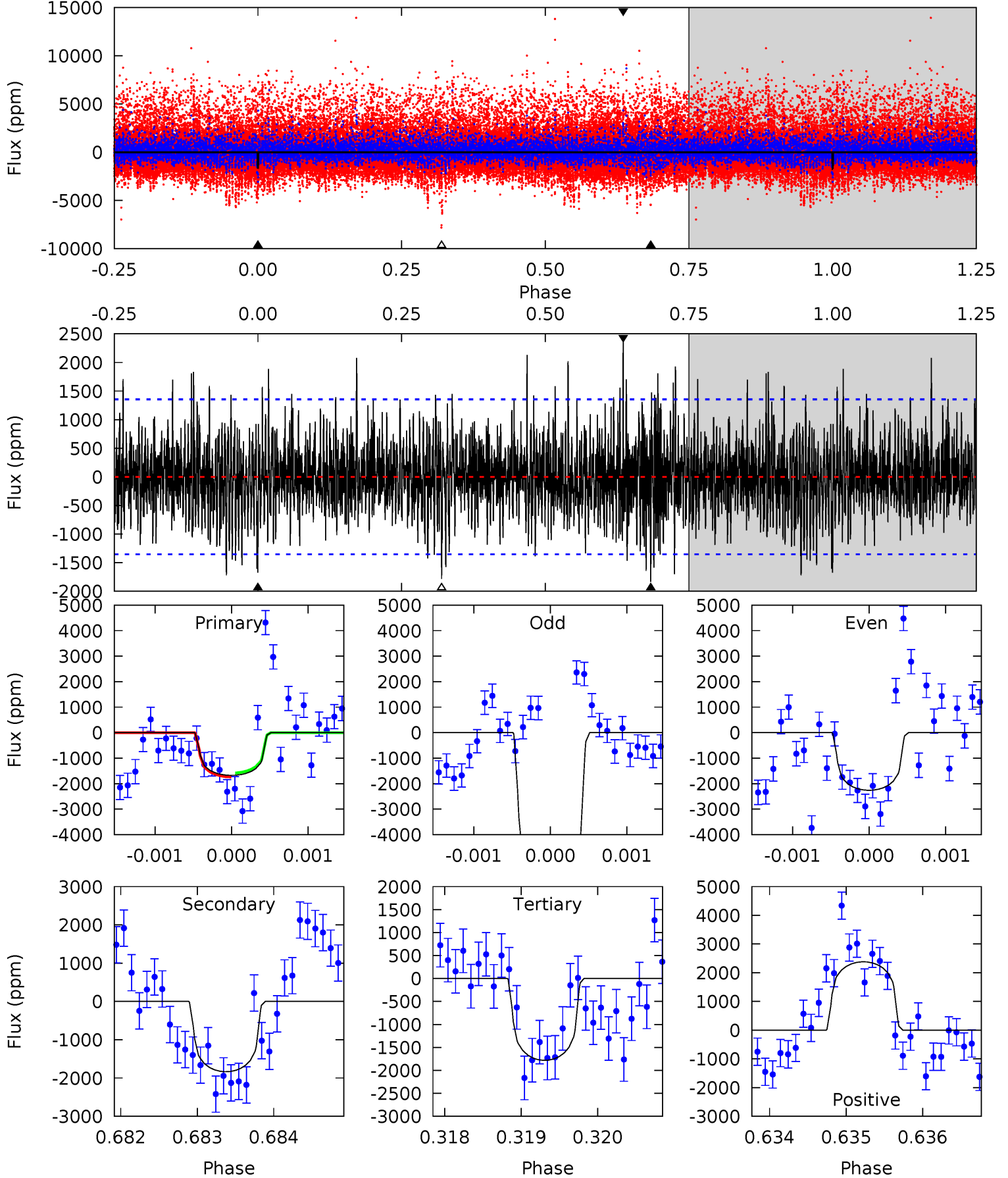
TCE 008611876-03 P=286.755312 Days  $T_0=251.901944$  (BKJD)



# DV Model-Shift Uniqueness Test

008611876-03, P = 286.745126 Days, E = 251.930746 Days

| Pri  | Sec  | Ter  | Pos  | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM   | Shape | TAT  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|-------|-------|------|
| 6.72 | 7.37 | 7.16 | 9.57 | 5.44            | 3.27            | 2.12             | -0.44   | -2.85   | 0.21    | -2.19   | 6.28    | -0.25 | 0.56  | 0.31 |

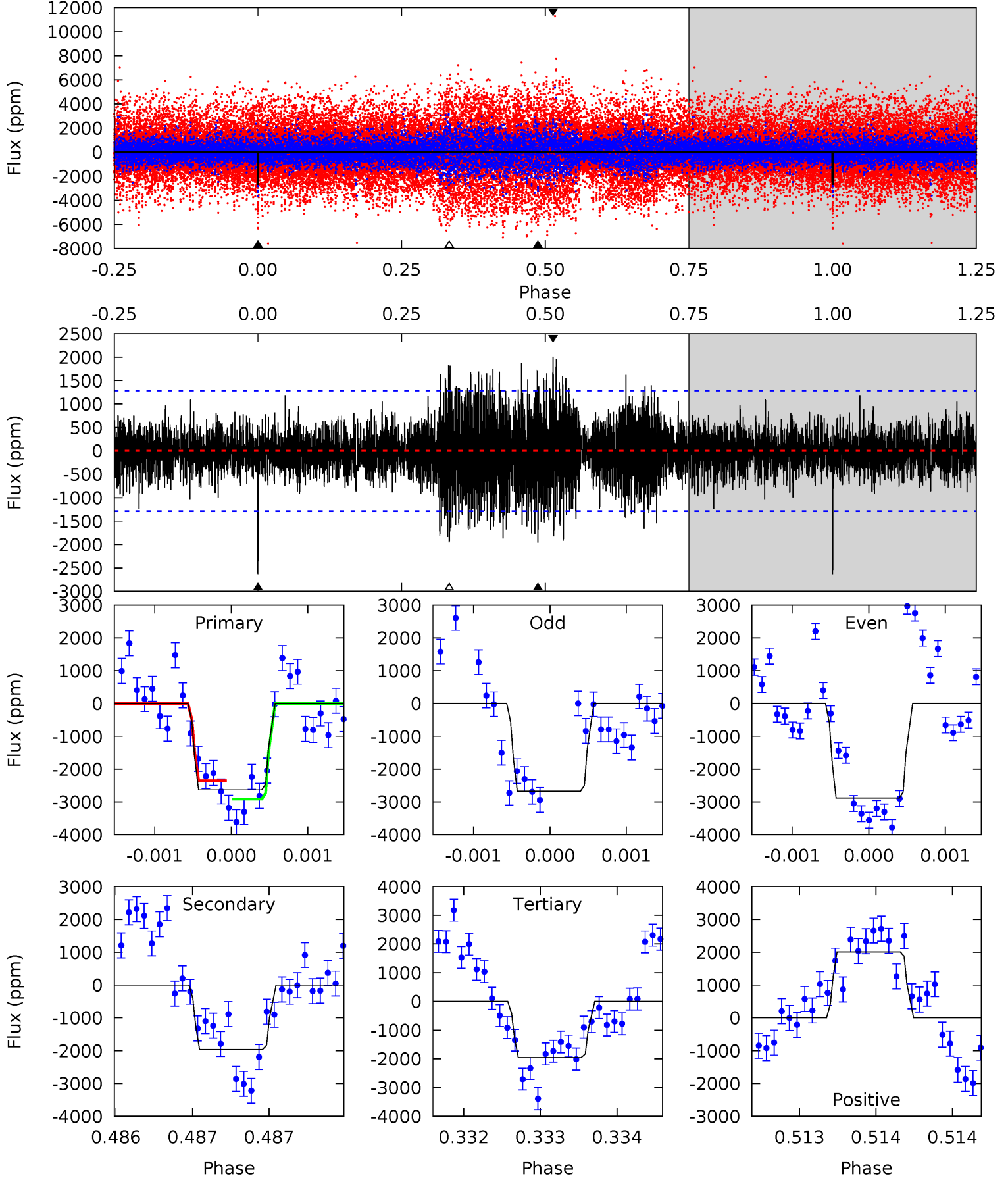




# Alt Model-Shift Uniqueness Test

008611876-03, P = 286.755312 Days, E = 251.901944 Days

| Pri  | Sec  | Ter  | Pos  | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|-----|
| 11.2 | 8.36 | 8.31 | 8.57 | 5.49            | 3.35            | 2.32             | 2.90    | 2.65    | 0.05    | -0.21   | 0.37    | 0.79 | 0.43  | 0   |



### Stellar Parameters For KIC 008611876

|        | $T_{\text{eff}}(K)$ | $\log(g)$                 | [Fe/H]                    | $R (R_{\odot})$           | $M(M_{\odot})$            | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|---------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
|        | $3288^{+44}_{-34}$  | $5.033^{+0.044}_{-0.044}$ | $0.000^{+0.100}_{-0.100}$ | $0.231^{+0.035}_{-0.025}$ | $0.210^{+0.041}_{-0.027}$ | $23.930^{+5.802}_{-5.075}$                |
|        | +1%/-1%             | +1%/-1%                   | +inf%/-inf%               | +15%/-11%                 | +20%/-13%                 | +24%/-21%                                 |
| Source | PHO2                | PHO2                      | PHO2                      | DSEP                      |                           |   |

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 008611876-03 / KOI

| Detrend | Depth (ppm)     | $R_p (R_{\oplus})$     | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$ | $A_{\text{obs}}$            |
|---------|-----------------|------------------------|----------------------|----------------------|-----------------------------|
| DV      | $-1836 \pm 249$ | $1.32^{+0.72}_{-0.68}$ | $137^{+3}_{-3}$      | $3107^{+755}_{-368}$ | $144372^{+460402}_{-83747}$ |
| Alt.    | $-1962 \pm 235$ | $1.36^{+0.81}_{-0.71}$ | $137^{+3}_{-3}$      | $3112^{+836}_{-377}$ | $153687^{+531378}_{-94871}$ |

$T_{\text{max}}$  = Theoretical Maximum Planetary Temperature

$T_{\text{obs}}$  = Observed Planetary Temperature (Assuming A=0.3)

$A_{\text{obs}}$  = Observed Albedo (Assuming T=0)

If a secondary eclipse is present, the system is likely an EB if  $T_{\text{obs}} \gg T_{\text{max}}$  AND  $A_{\text{obs}} \gg 1.0$

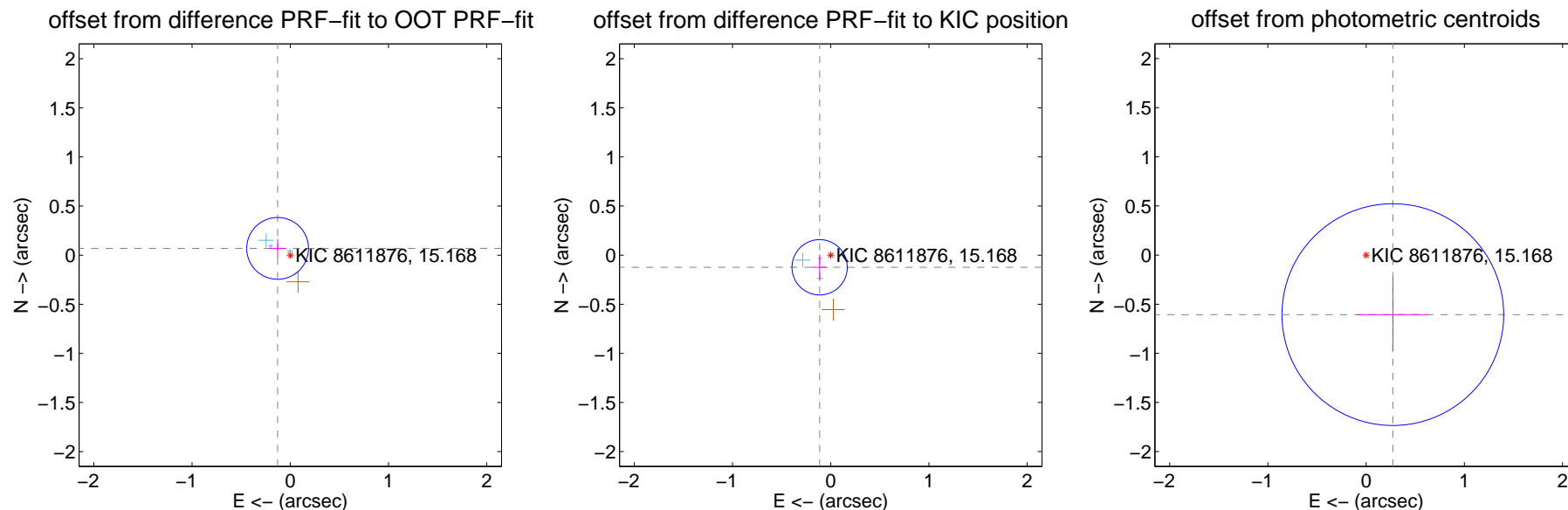
## DV Centroid Data

Supplemental centroid analysis for 008611876-03. Kepler magnitude: 15.17. Transit SNR 6.56

There are 3 quarters with good PRF difference image offsets

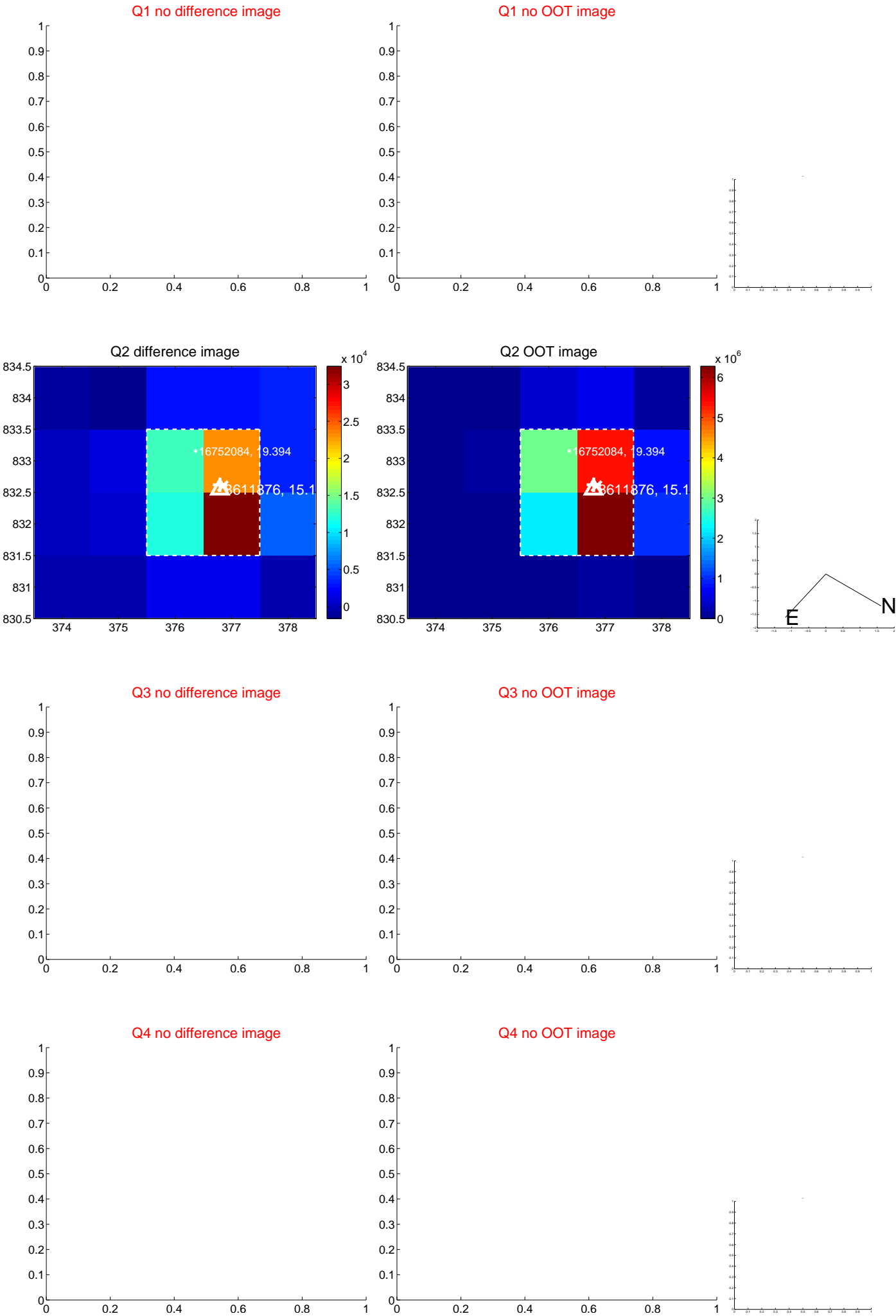
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

|   | Distance in arcsec | Distance / $\sigma$ | $\Delta$ RA       | $\Delta$ Dec       |
|---|--------------------|---------------------|-------------------|--------------------|
| PRF-fit source offset from OOT          | $0.146 \pm 0.105$  | 1.40                | $0.129 \pm 0.090$ | $0.069 \pm 0.096$  |
| PRF-fit source offset from KIC position | $0.167 \pm 0.094$  | 1.78                | $0.113 \pm 0.080$ | $-0.124 \pm 0.129$ |
| photometric centroid source offset      | $0.66 \pm 0.38$    | 1.77                | $-0.27 \pm 0.36$  | $-0.61 \pm 0.38$   |

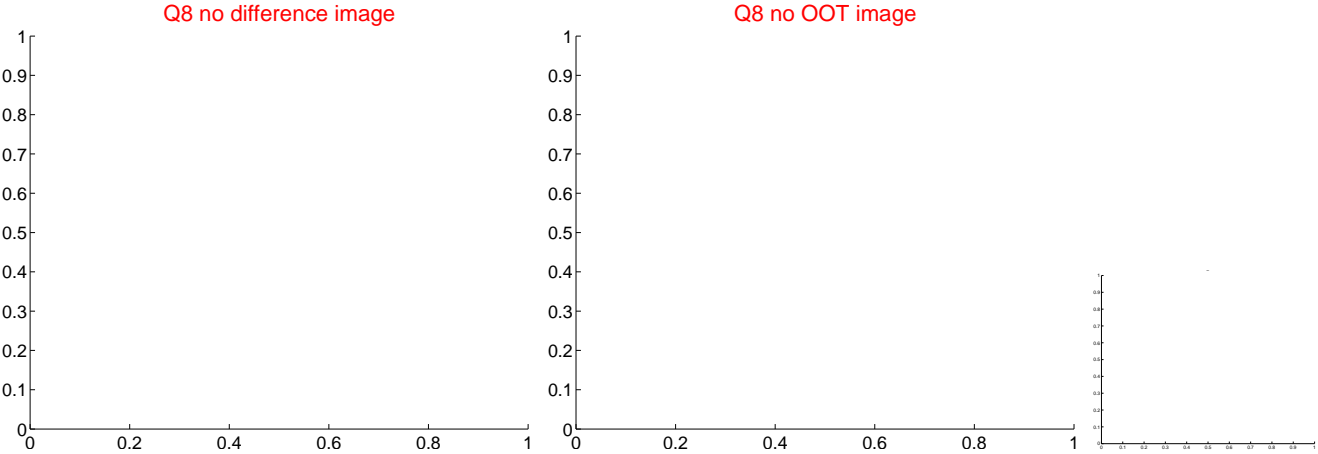
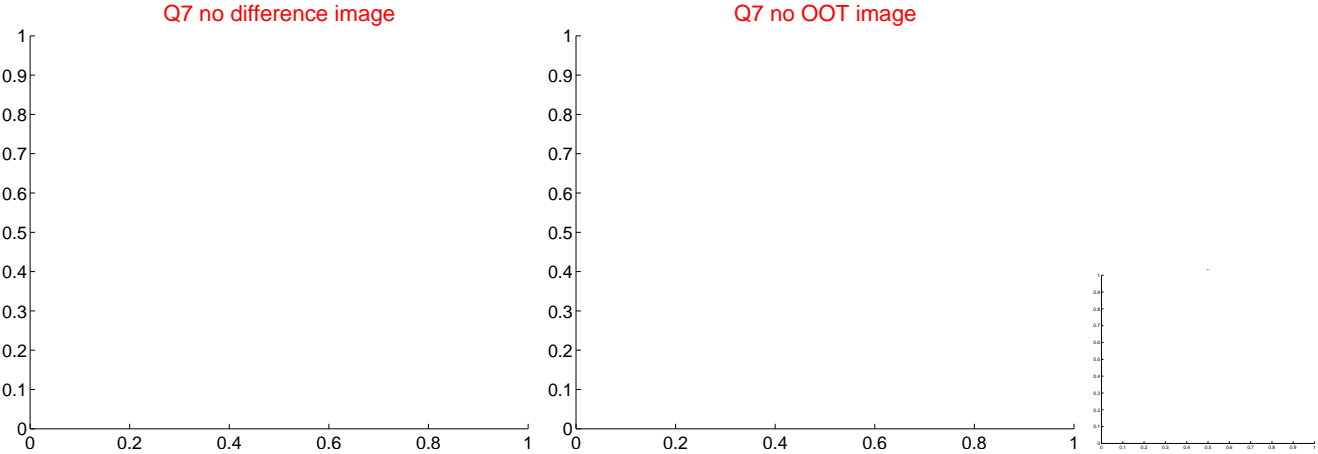
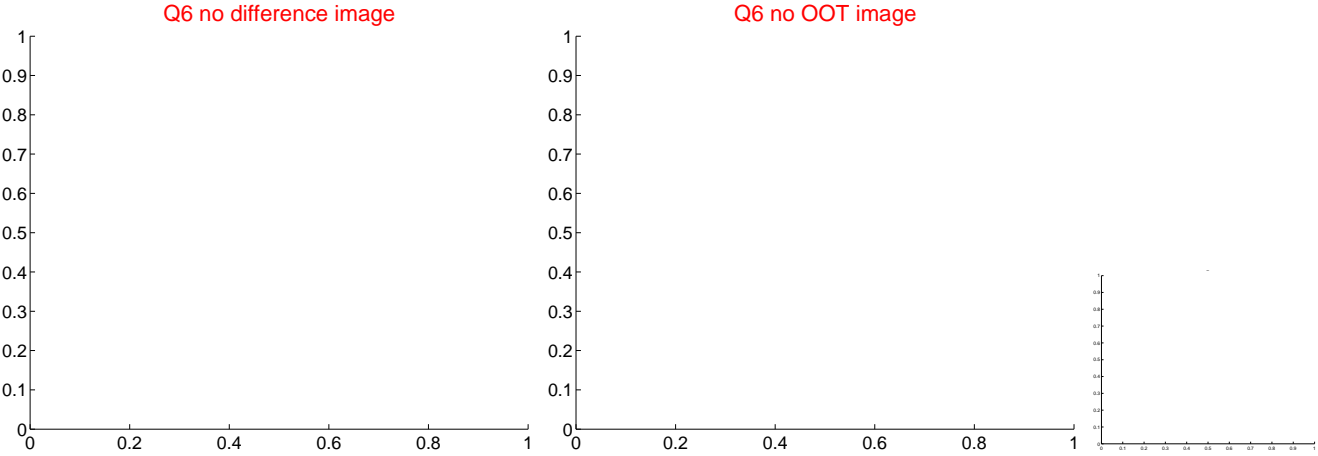
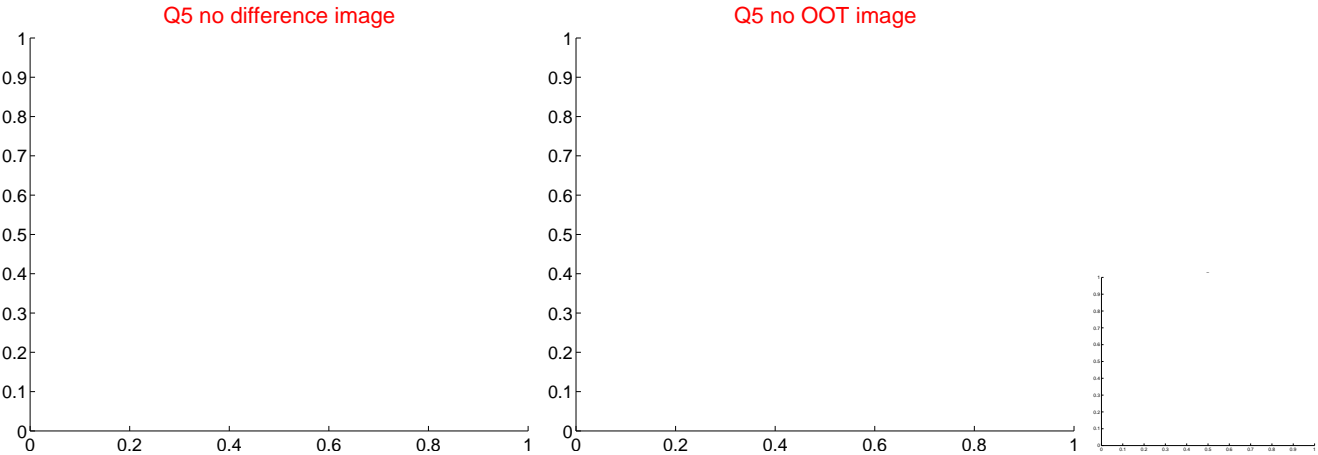


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

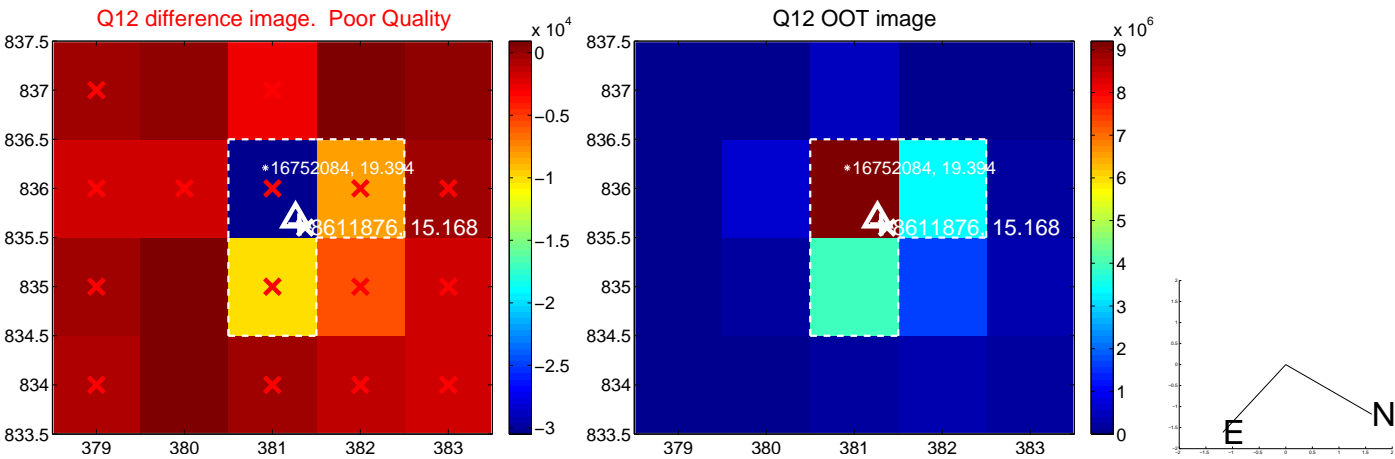
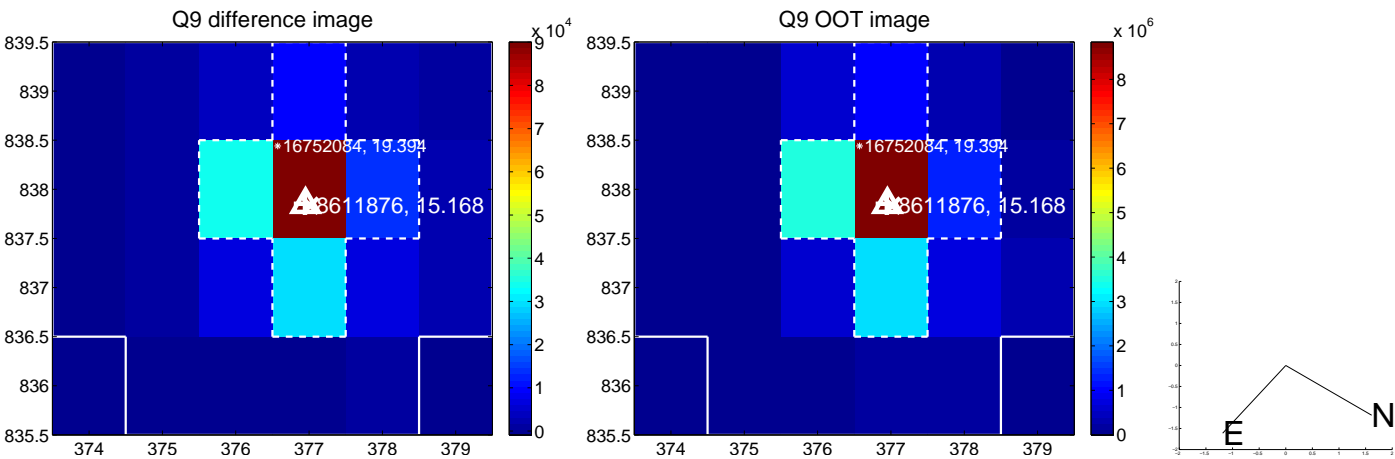
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



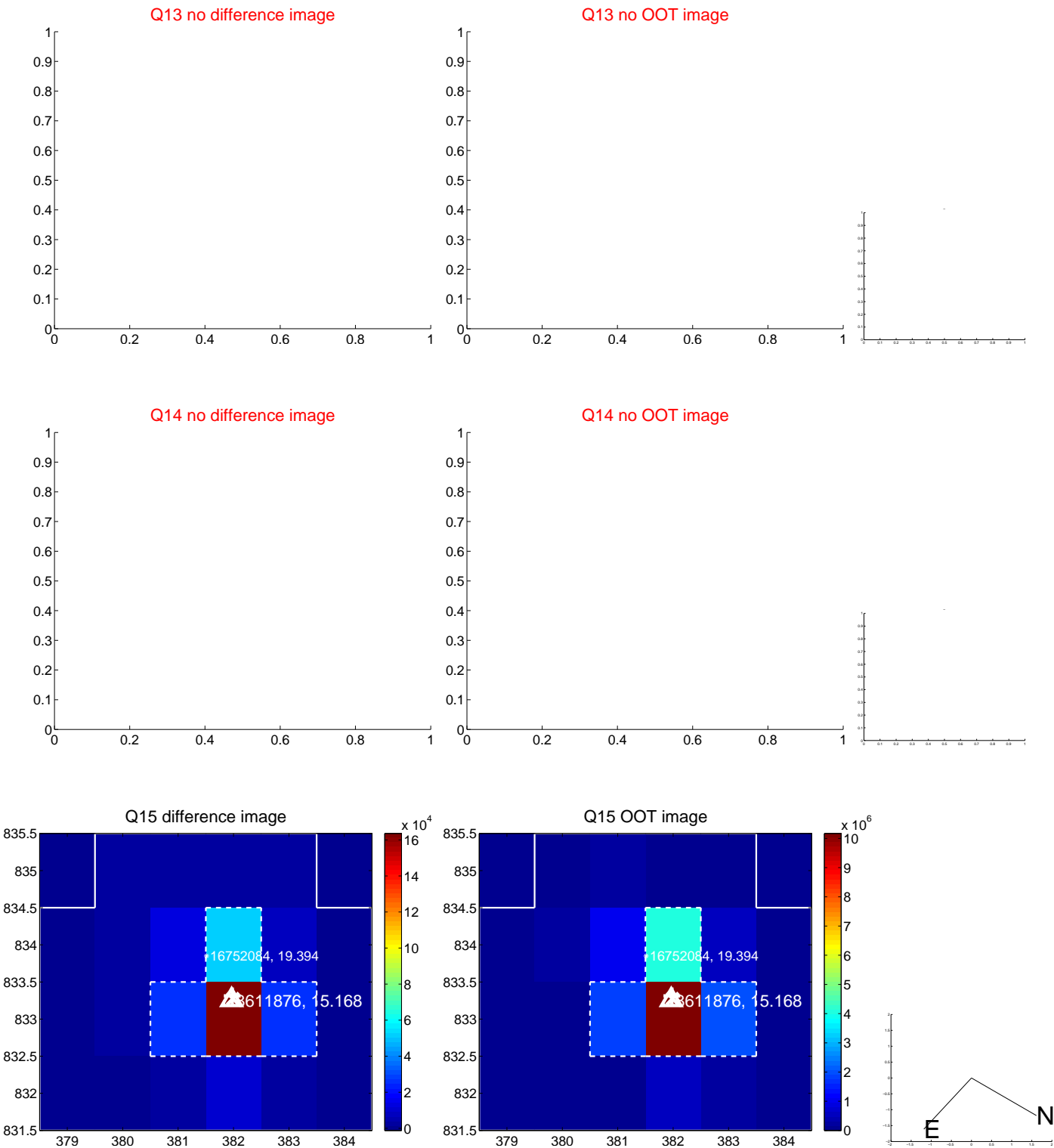
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



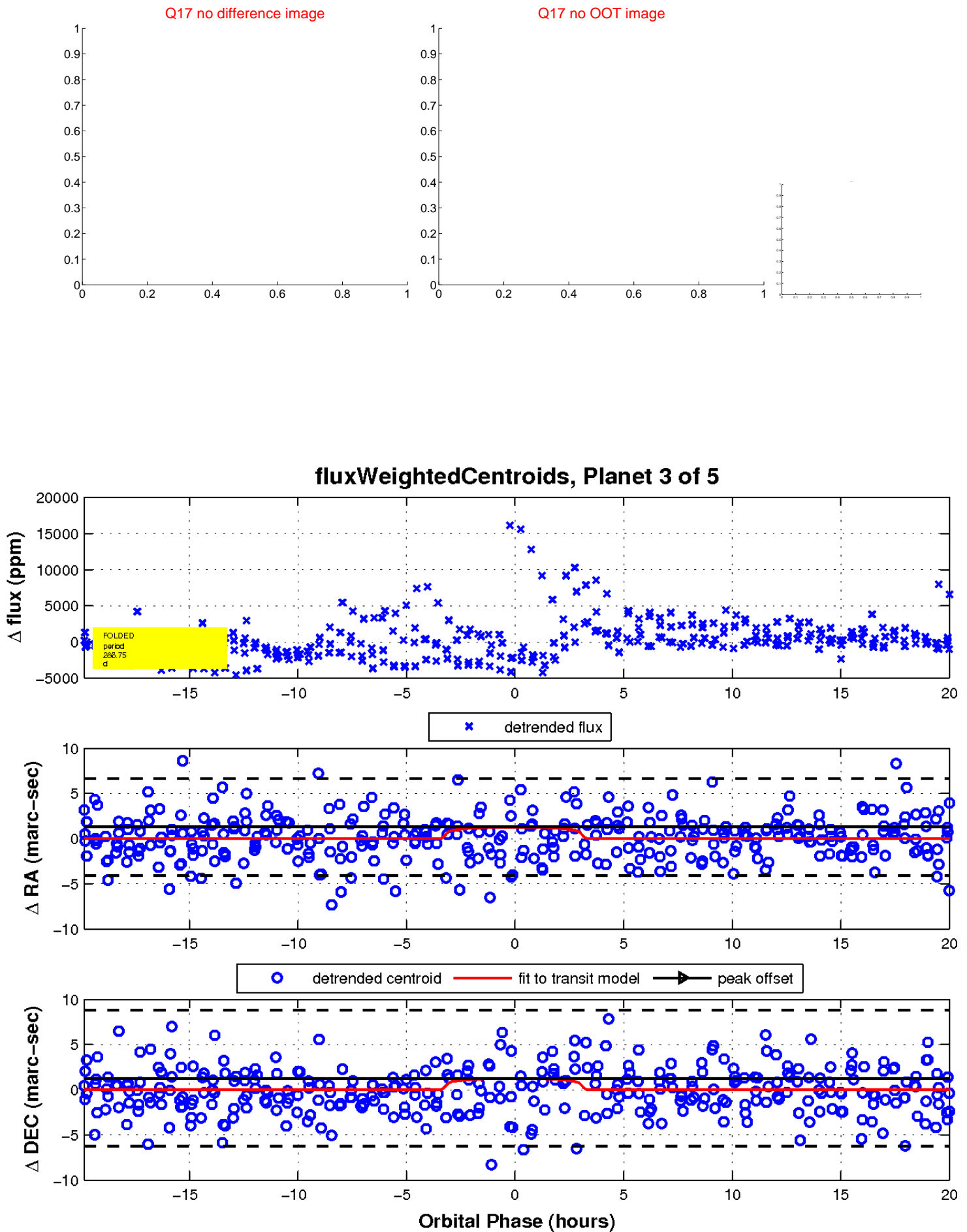
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



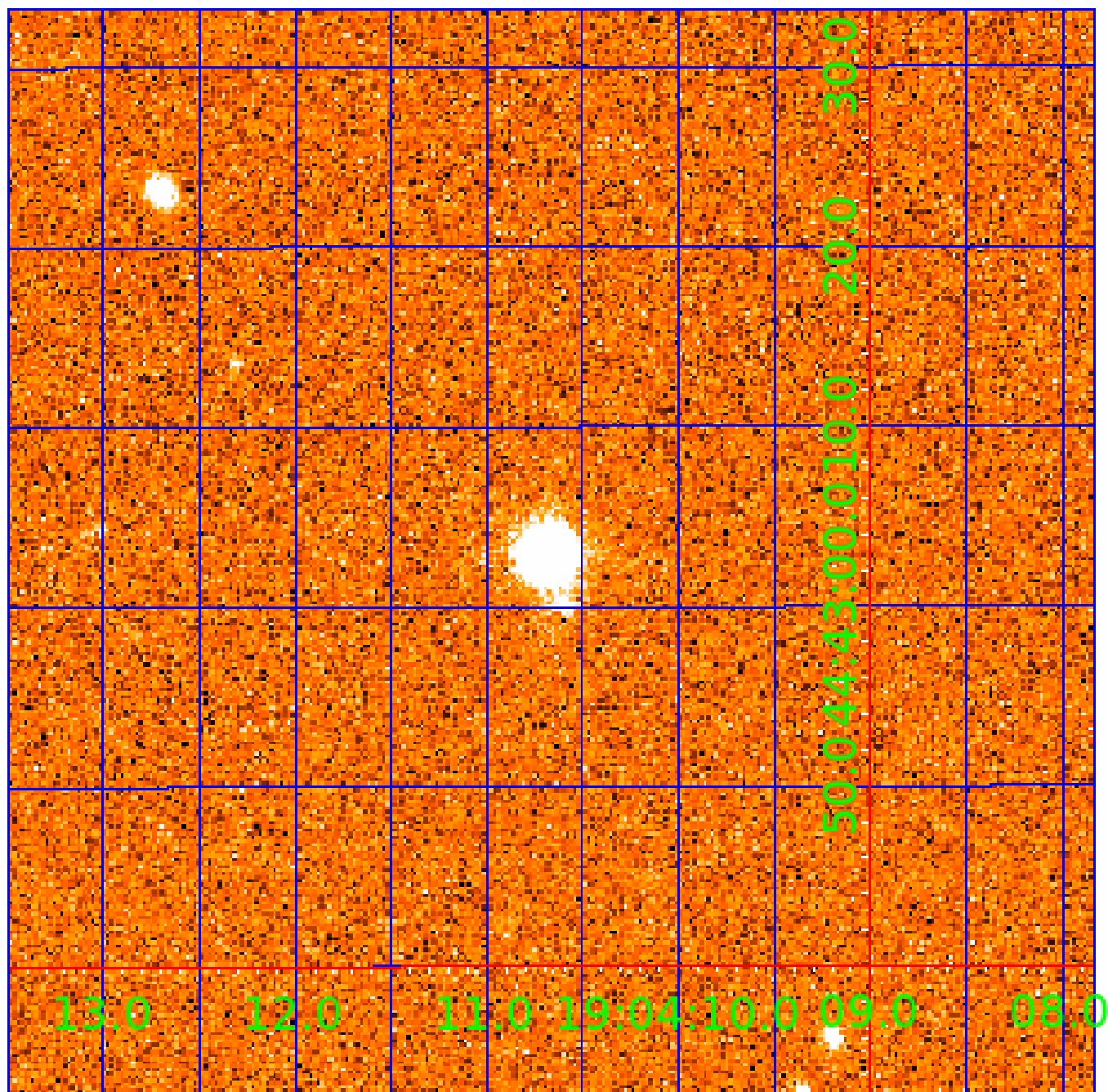
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





# UKIRT Image

Declination



# KIC 008611876

## Q1-17 DR25 TCE Parameters

| TCE          | Run Type | KOI? | Period (Days) | Epoch (BKJD) | Depth (ppm) | Duration (Hours) | MES  | SNR | $R_{\star}$ ( $R_{\odot}$ ) | $T_{\star}$ (K) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|-----|-----------------------------|-----------------|------------------------|------------------------|
| 008611876-01 | OBS      | No   | 624.538021    | 192.227622   | 3450.8      | 4.206            | 13.1 | 7.1 | 0.23                        | 3288            | 1.59                   | 0.01                   |
| 008611876-02 | OBS      | No   | 264.532828    | 391.160973   | 2149.1      | 25.185           | 9.5  | 7.3 | 0.23                        | 3288            | 1.06                   | 0.02                   |
| 008611876-03 | OBS      | No   | 286.745126    | 251.930746   | 3239.9      | 6.687            | 11.7 | 6.6 | 0.23                        | 3288            | 1.30                   | 0.02                   |
| 008611876-04 | OBS      | No   | 242.948585    | 325.990640   | 2444.9      | 3.689            | 11.3 | 7.4 | 0.23                        | 3288            | 1.13                   | 0.03                   |
| 008611876-05 | OBS      | No   | 346.285635    | 168.337816   | 1354.2      | 7.906            | 10.4 | 3.1 | 0.23                        | 3288            | 0.93                   | 0.02                   |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments  |
|--------------|----------|------|-------|---|---|---|---|---|
| 008611876-01 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS |
| 008611876-02 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS                             |
| 008611876-03 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT   |
| 008611876-04 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT   |
| 008611876-05 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS     |

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

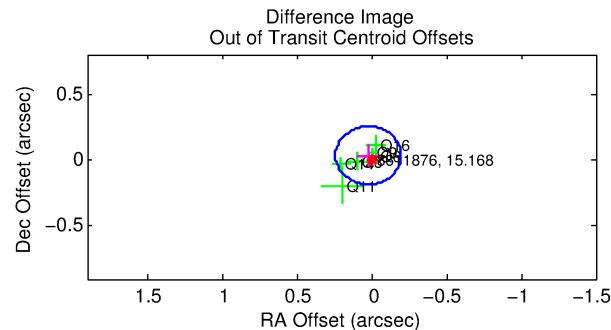
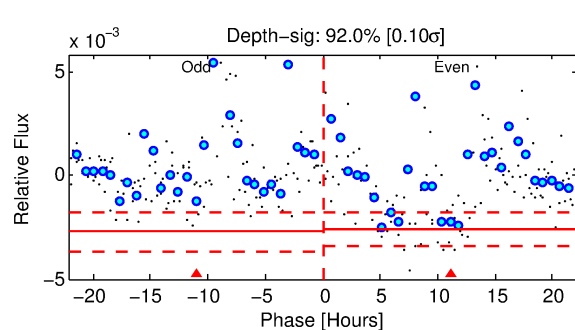
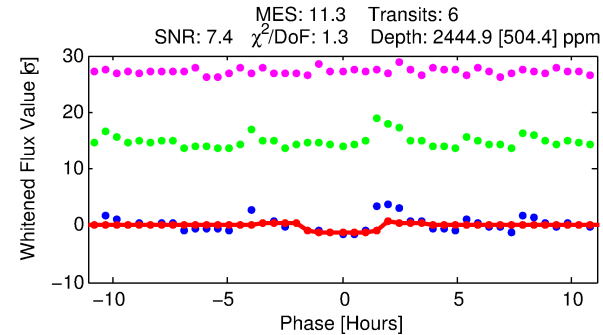
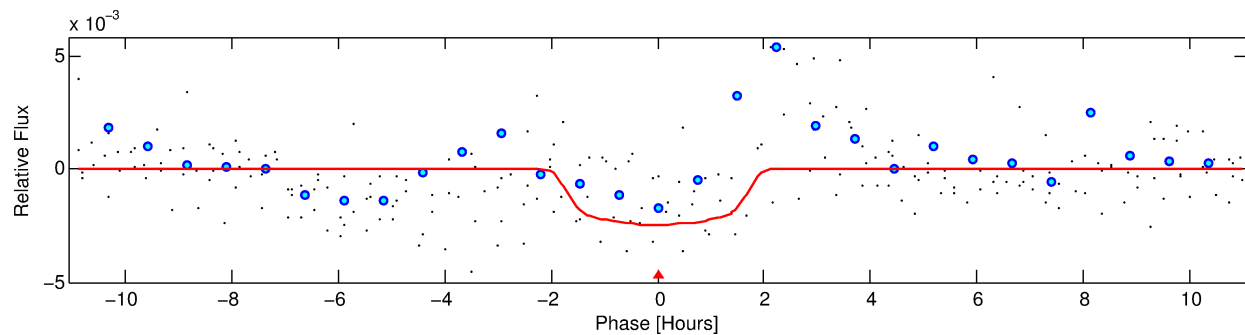
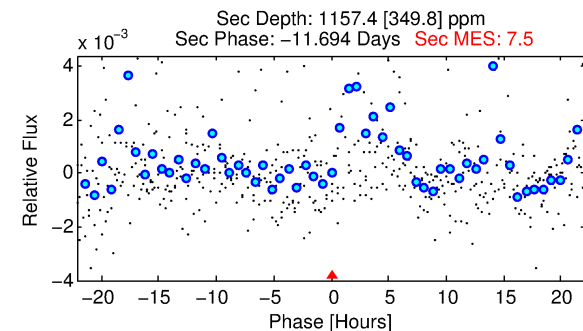
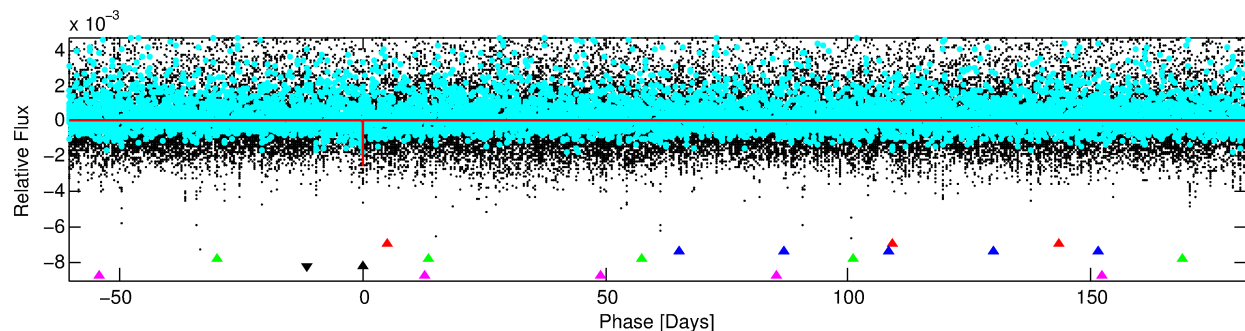
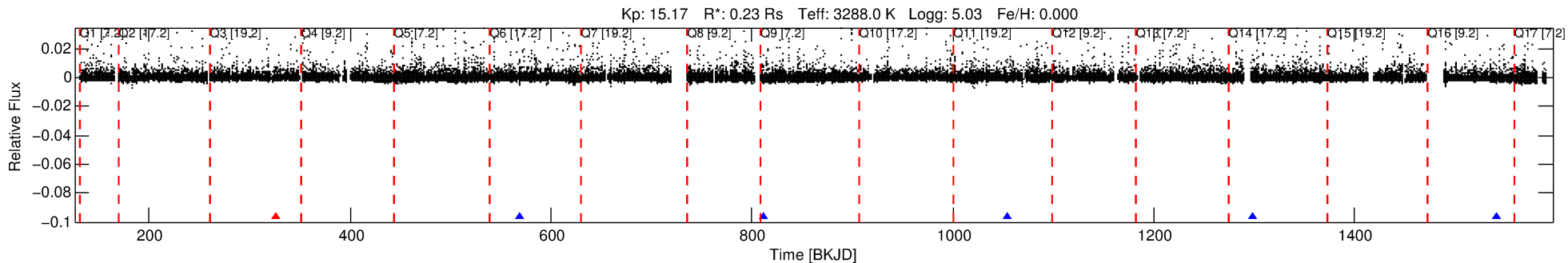
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 008611876-04

No Significant Match Found

# DV One-Page Summary

KIC: 8611876 Candidate: 4 of 5 Period: 242.949 d



## DV Fit Results:

Period = 242.94859 [0.00317] d  
Epoch = 325.9906 [0.0094] BKJD  
Rp/R\* = 0.0447 [0.0588]  
a/R\* = 525.56 [2953.72]  
b = 0.02 [304.80]  
Seff = 0.03 [0.00]  
Teq = 104 [3] K  
Rp = 1.13 [1.49] Re  
a = 0.4530 [0.0482] AU  
Ag = 102850.10 [272639.70] [0.38σ]  
Teffp = 2868 [1899] K [1.46σ]

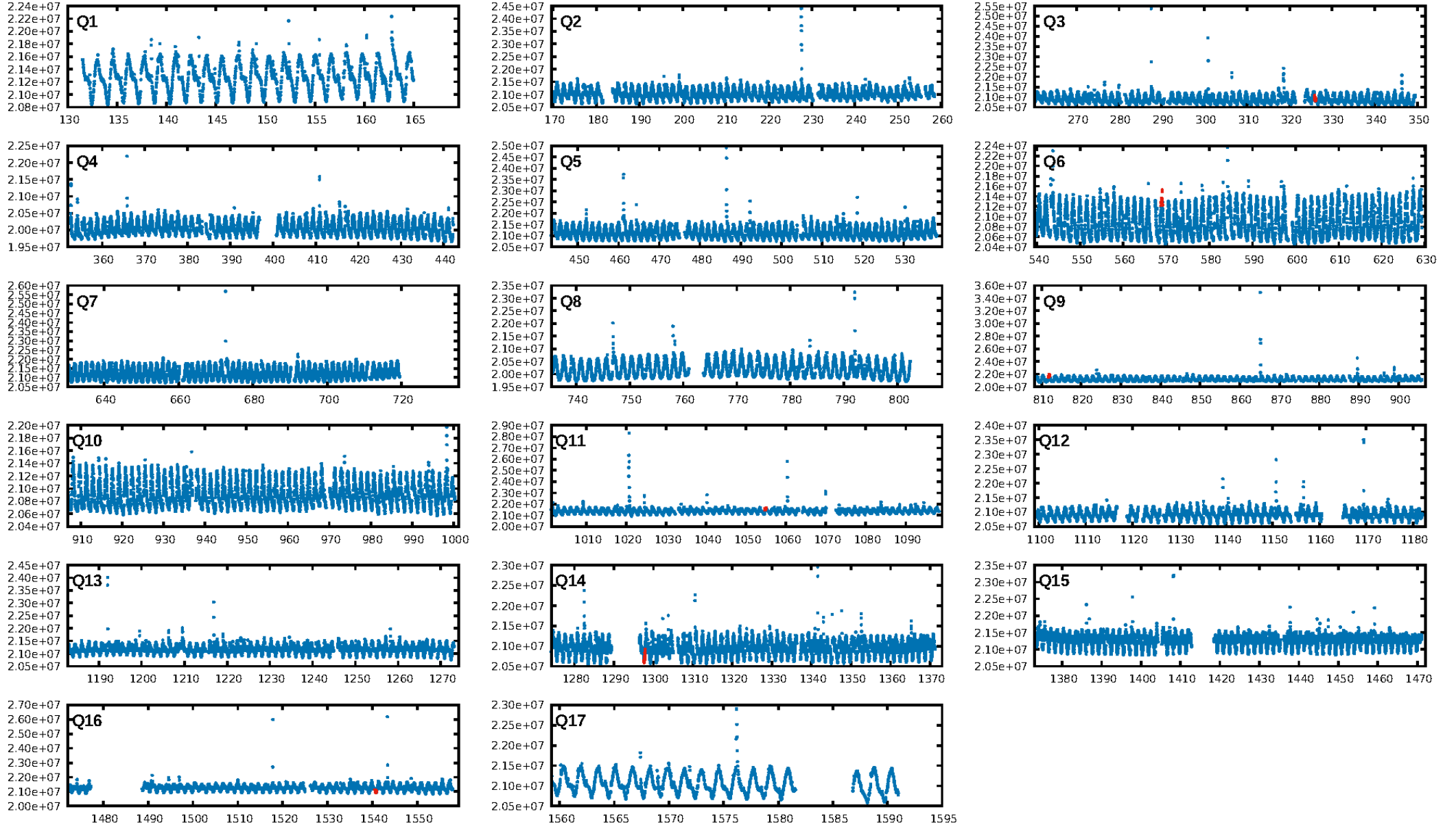
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [20.35σ]  
ModelChiSquare2-sig: 7.8%  
ModelChiSquareGof-sig: 99.1%  
**Bootstrap-pfa: 1.62e-09**  
RollingBand-fgt: 0.83 [5/6]  
GhostDiagnostic-chr: -2.5  
Centroid-sig: 17.7%  
Centroid-so: 0.621 arcsec [1.28σ]  
OotOffset-rm: 0.041 arcsec [0.56σ]  
**KicOffset-rm: 0.221 arcsec [3.01σ]**  
OotOffset-st: 2/2/1/1 [6]  
KicOffset-st: 2/2/1/1 [6]  
DiffImageQuality-fgm: 0.50 [3/6]  
DiffImageOverlap-fno: 1.00 [6/6]

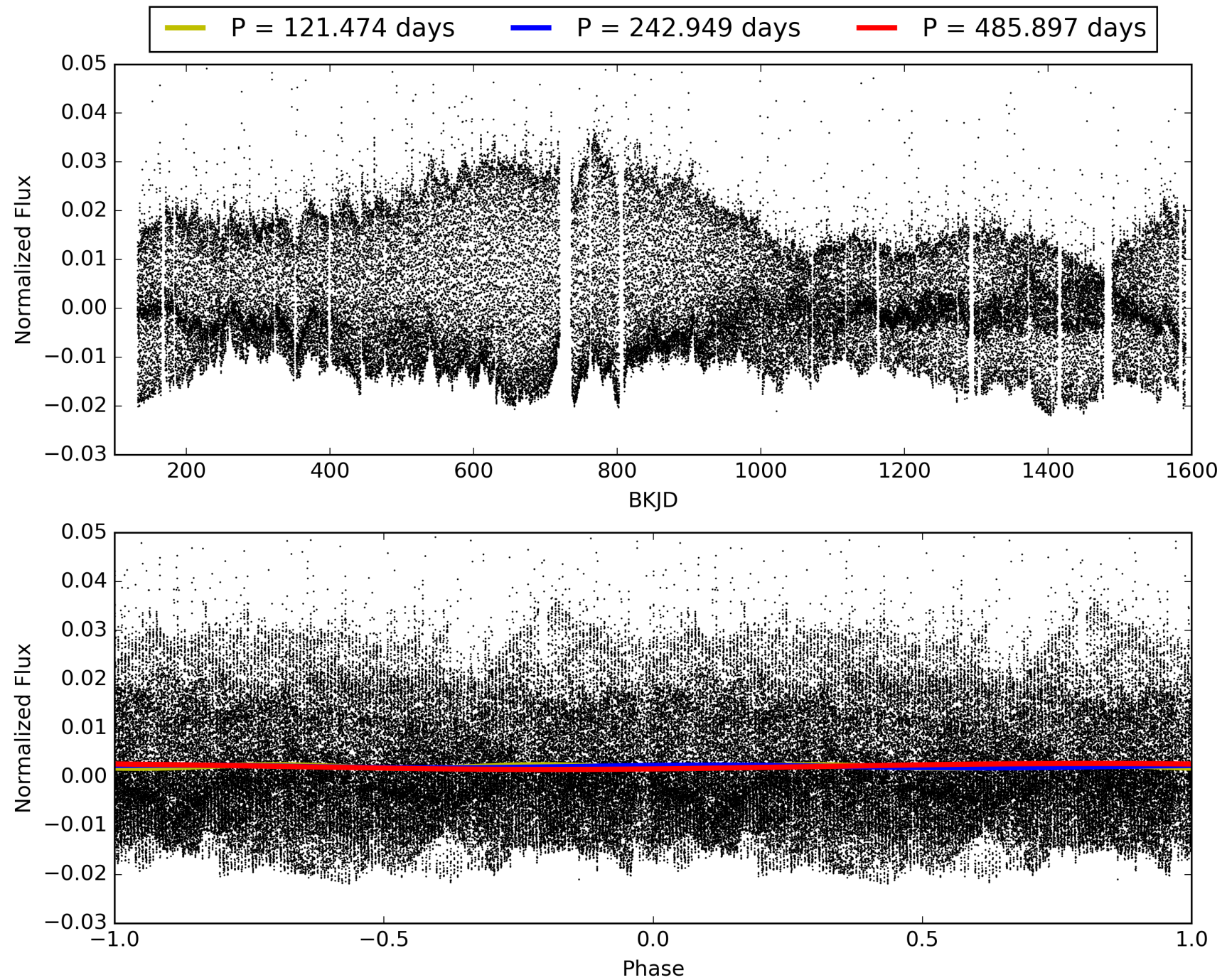
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 05:49:03 Z

This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 008611876-04, PDC Light Curves

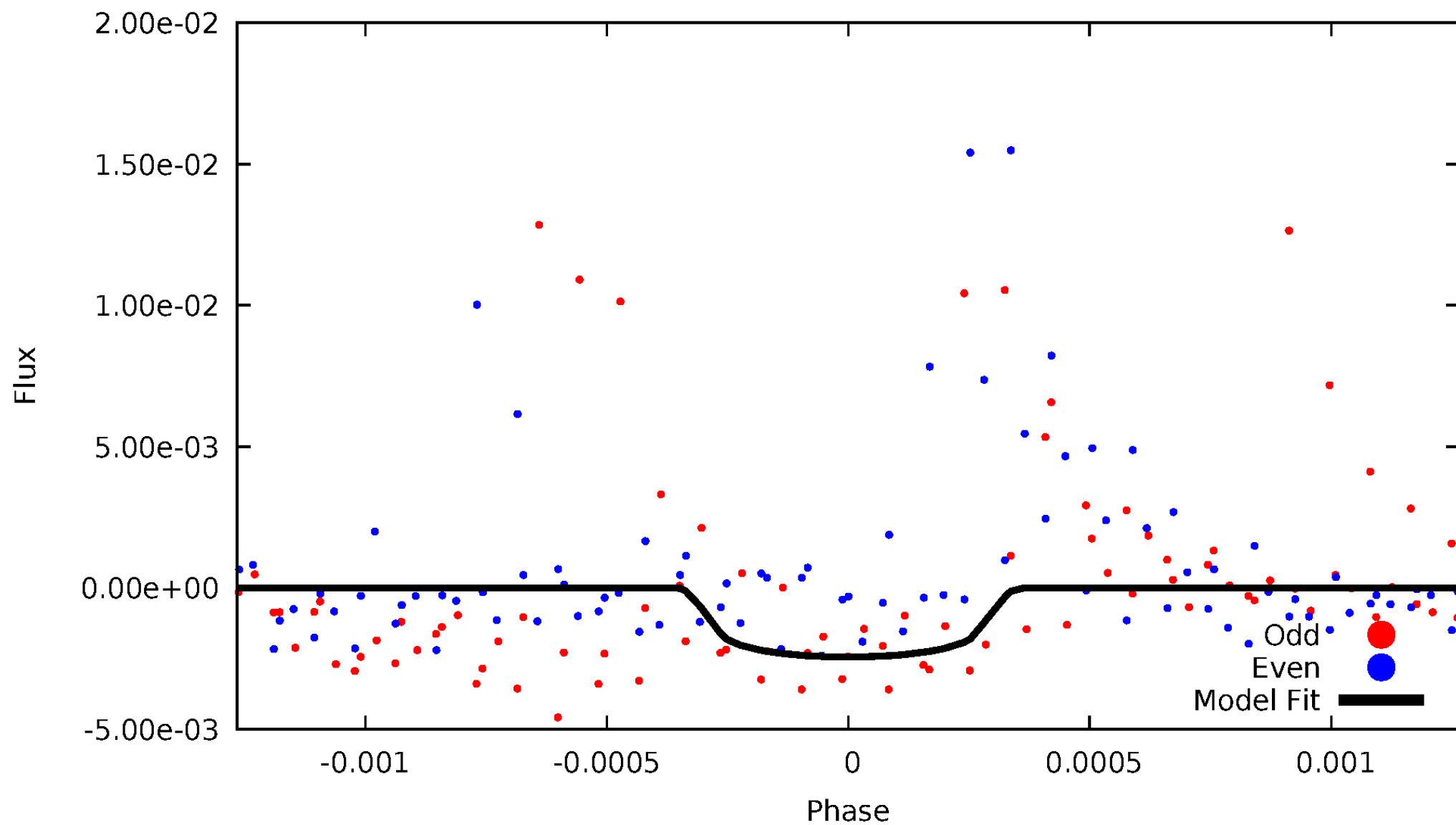


TCE 008611876-04



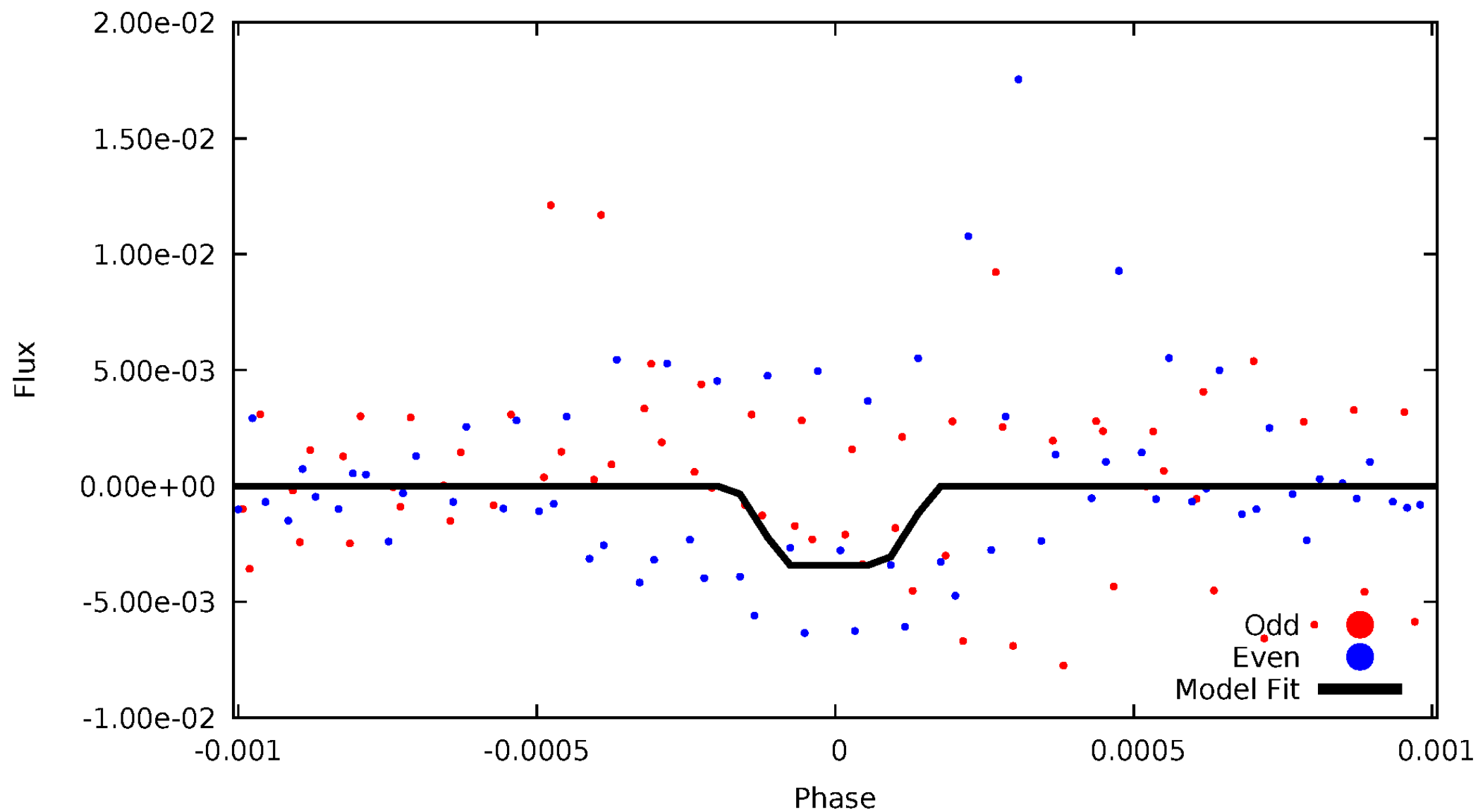
# DV Odd/Even

TCE 008611876-04



# ALT Odd/Even

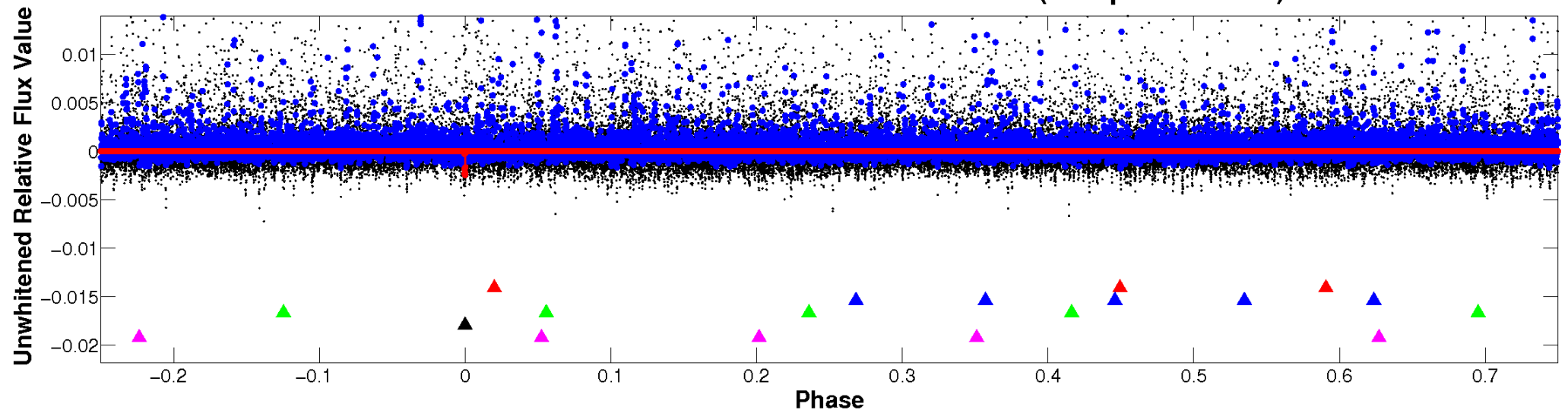
TCE 008611876-04



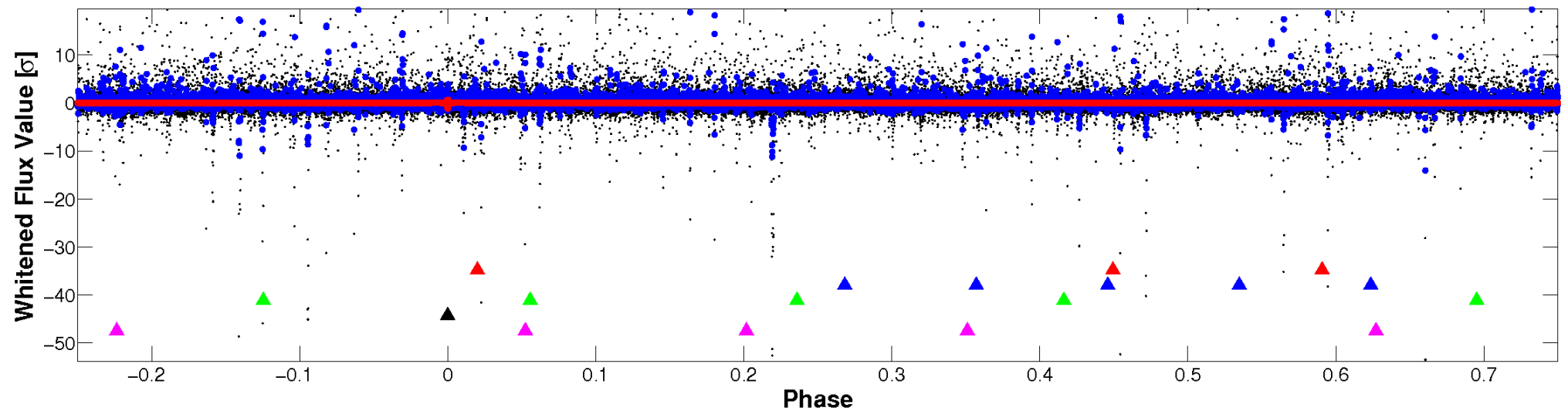


# Non-Whitened Vs. Whitened Light Curve

## Planet 4 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)



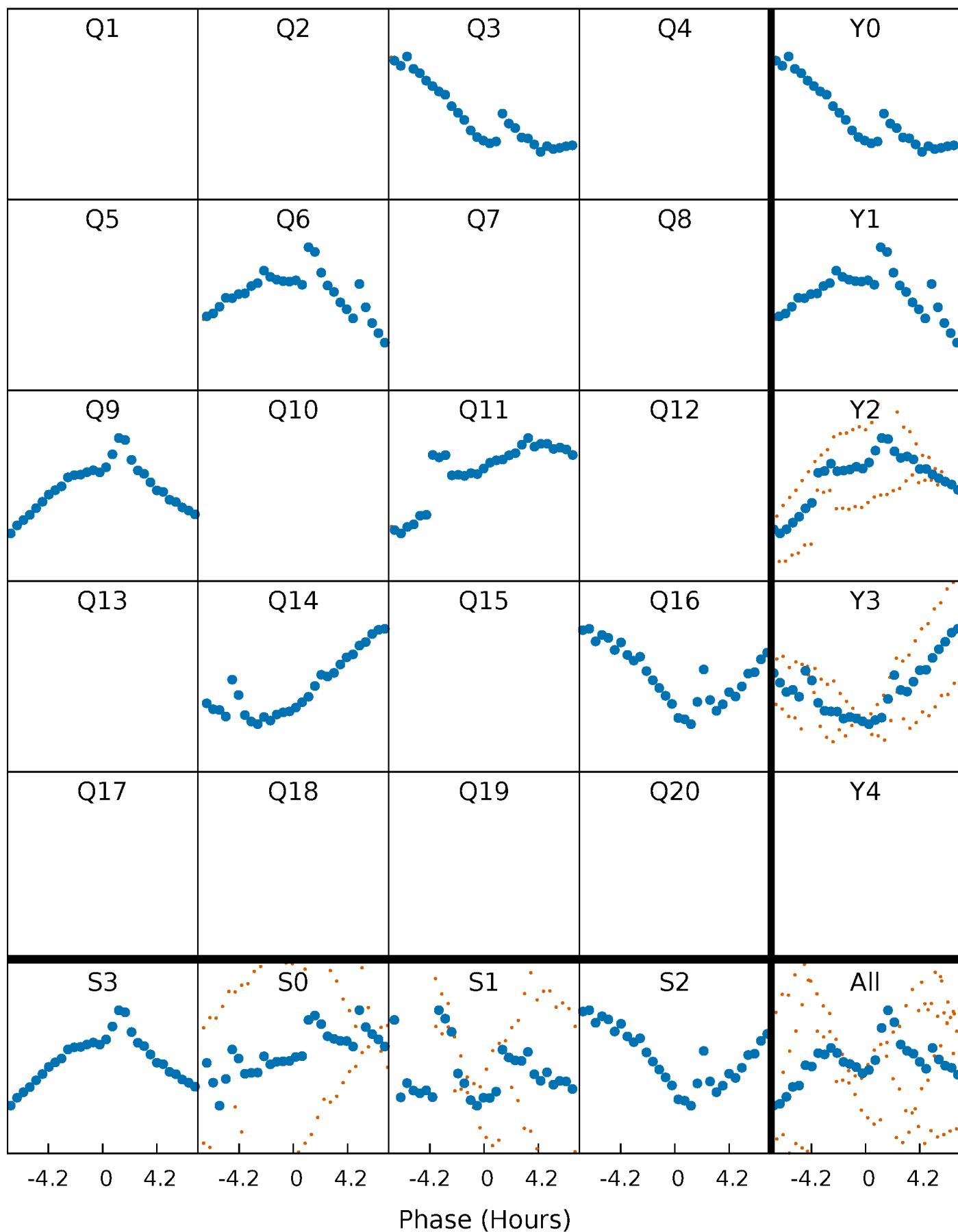
## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)





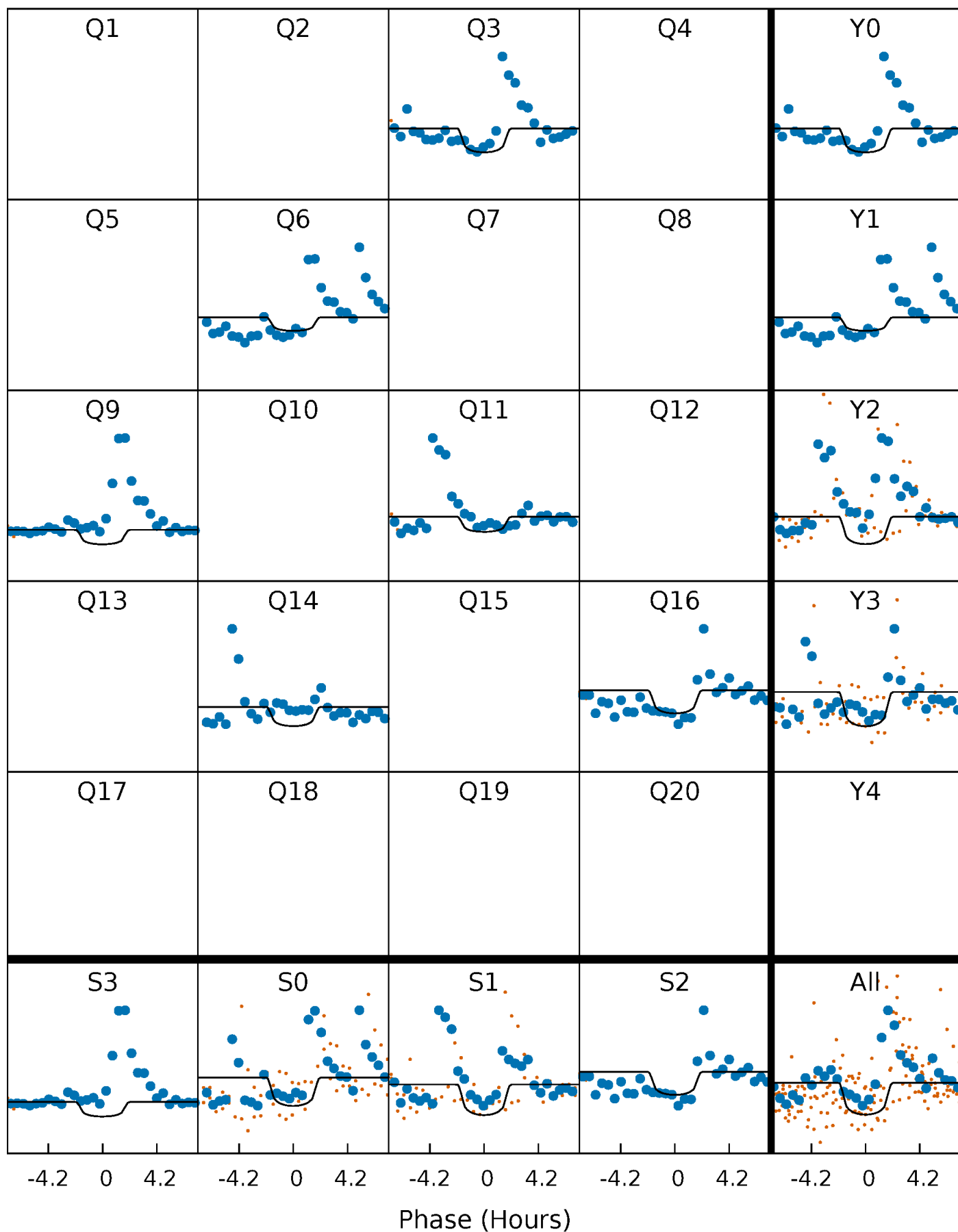
# PDC Quarter-Phased Transit Curves

TCE 008611876-04 P=242.948585 Days  $T_0=325.990640$  (BKJD)



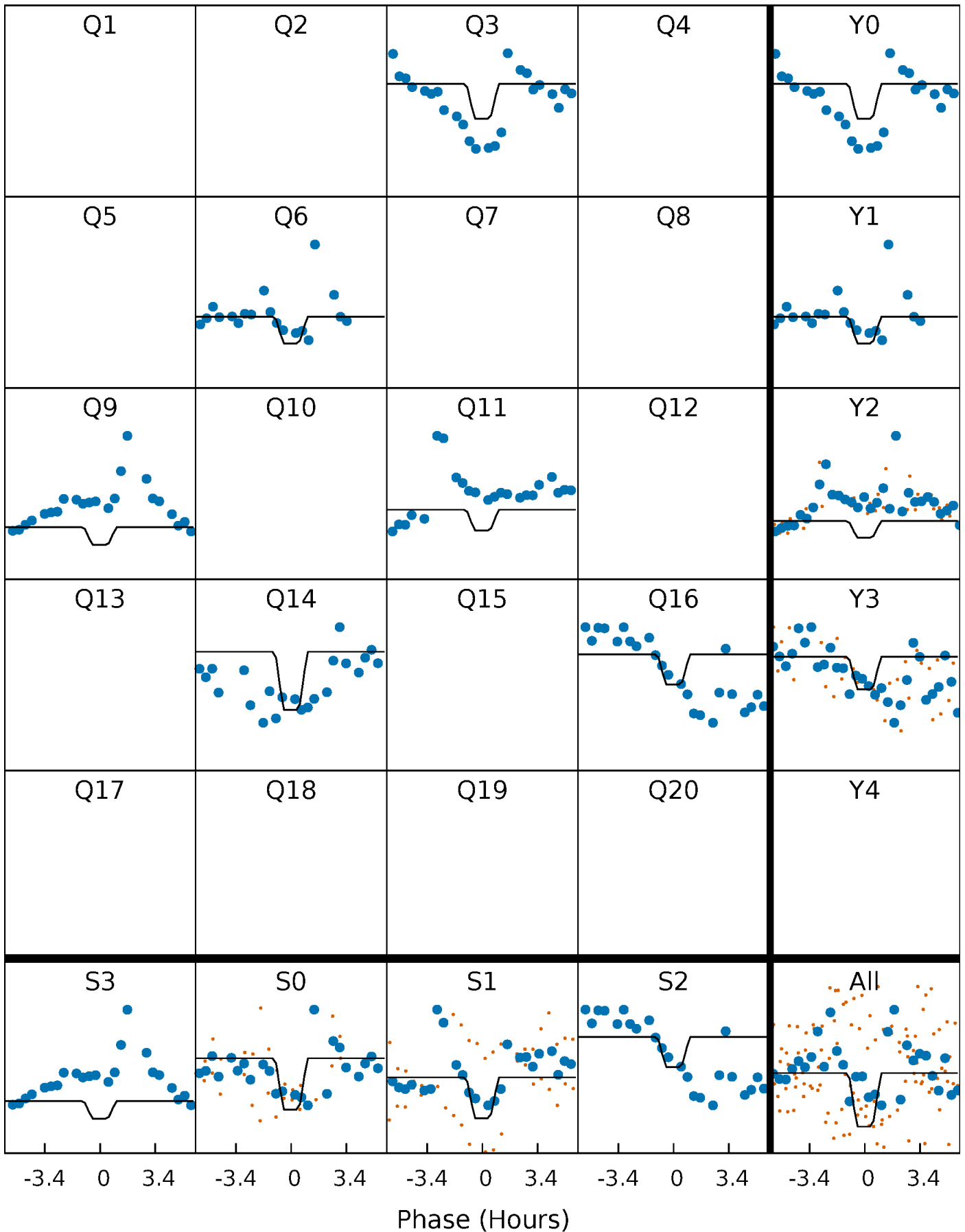
# DV Quarter-Phased Transit Curves

TCE 008611876-04     $P=242.948585$  Days     $T_0=325.990640$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

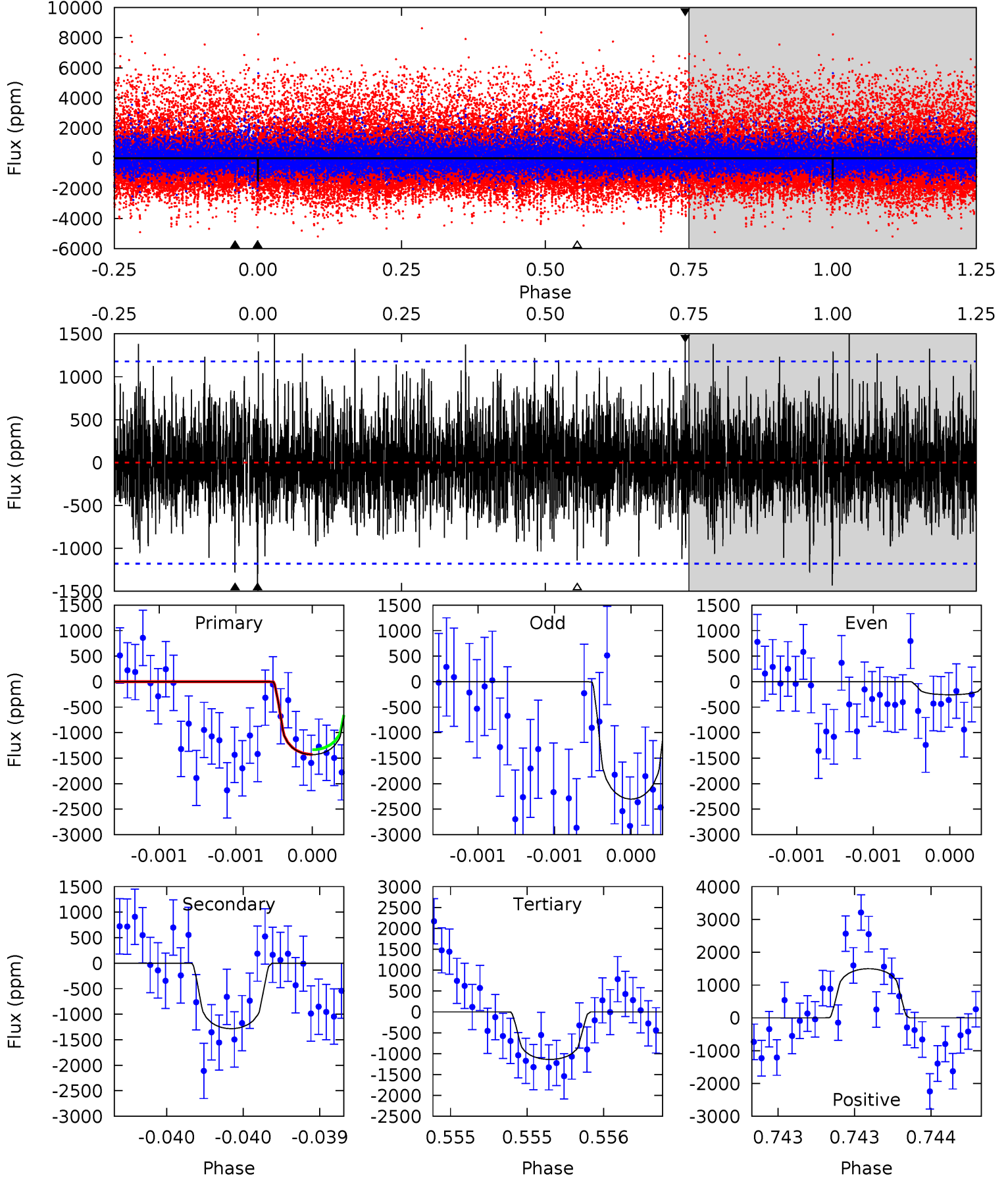
TCE 008611876-04 P=242.942443 Days  $T_0=325.989707$  (BKJD)



# DV Model-Shift Uniqueness Test

008611876-04, P = 242.948585 Days, E = 83.042055 Days

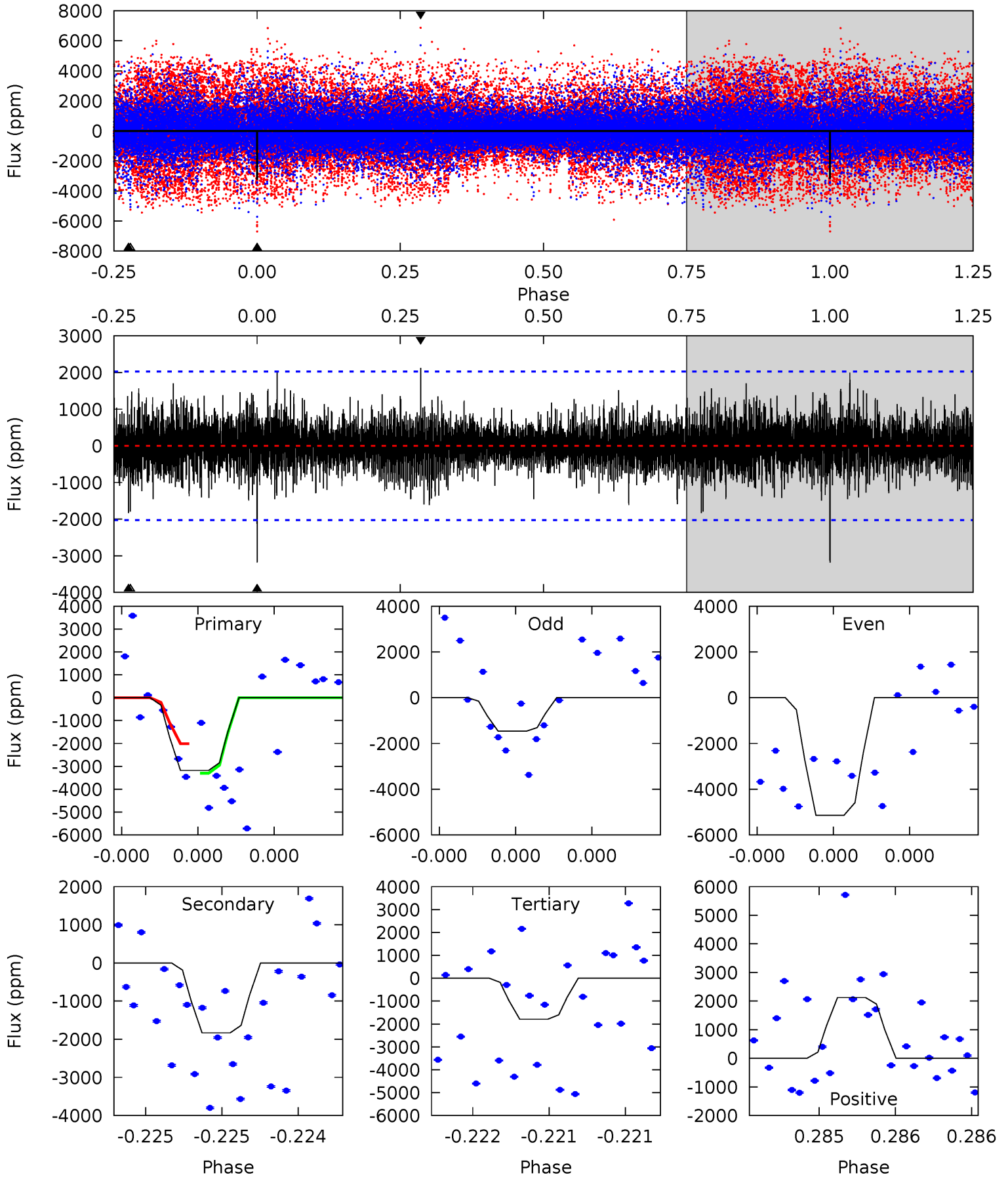
| Pri  | Sec  | Ter  | Pos  | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 6.70 | 6.01 | 5.34 | 7.02 | 5.52            | 3.40            | 1.76             | 1.37    | -0.31   | 0.68    | -1.01   | 4.31    | 0.39 | 0.51  | 0.22 |



# Alt Model-Shift Uniqueness Test

008611876-04, P = 242.942443 Days, E = 83.047264 Days

| Pri  | Sec  | Ter  | Pos  | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|-----|
| 8.86 | 5.11 | 4.99 | 5.92 | 5.65            | 3.59            | 1.18             | 3.87    | 2.94    | 0.12    | -0.81   | 5.10    | 0.50 | 0.40  | 0   |



### Stellar Parameters For KIC 008611876

|        | $T_{\text{eff}}(K)$ | $\log(g)$                 | [Fe/H]                    | $R (R_{\odot})$           | $M(M_{\odot})$            | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|---------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
|        | $3288^{+44}_{-34}$  | $5.033^{+0.044}_{-0.044}$ | $0.000^{+0.100}_{-0.100}$ | $0.231^{+0.035}_{-0.025}$ | $0.210^{+0.041}_{-0.027}$ | $23.930^{+5.802}_{-5.075}$                |
|        | +1%/-1%             | +1%/-1%                   | +inf%/-inf%               | +15%/-11%                 | +20%/-13%                 | +24%/-21%                                 |
| Source | PHO2                | PHO2                      | PHO2                      | DSEP                      |                           |   |

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 008611876-04 / KOI

| Detrend | Depth (ppm)     | $R_p (R_{\oplus})$     | $T_{max} (K)$   | $T_{obs} (K)$        | $A_{obs}$                  |
|---------|-----------------|------------------------|-----------------|----------------------|----------------------------|
| DV      | $-1283 \pm 213$ | $1.55^{+1.34}_{-0.95}$ | $145^{+4}_{-3}$ | $2807^{+993}_{-406}$ | $58420^{+368341}_{-41606}$ |
| Alt.    | $-1834 \pm 359$ | $1.85^{+1.43}_{-1.11}$ | $145^{+3}_{-3}$ | $2818^{+886}_{-381}$ | $58358^{+310041}_{-39309}$ |

$T_{max}$  = Theoretical Maximum Planetary Temperature

$T_{obs}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )

$A_{obs}$  = Observed Albedo (Assuming  $T=0$ )

If a secondary eclipse is present, the system is likely an EB if  $T_{obs} \gg T_{max}$  AND  $A_{obs} \gg 1.0$

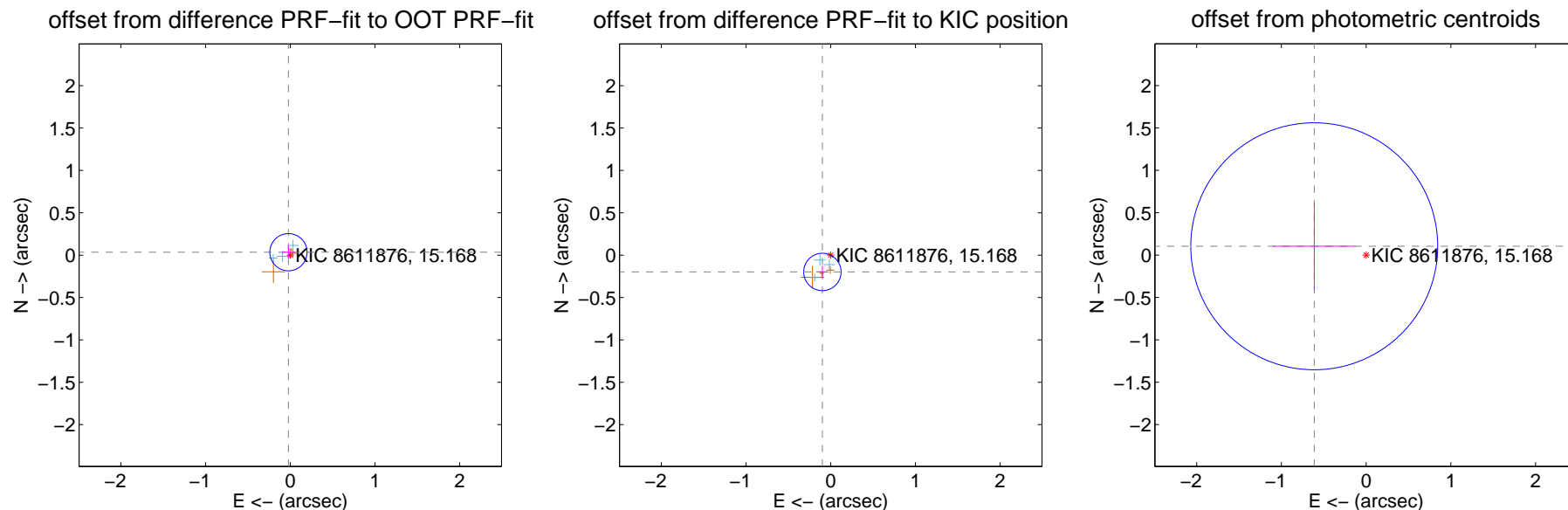
## DV Centroid Data

Supplemental centroid analysis for 008611876-04. Kepler magnitude: 15.17. Transit SNR 7.42

There are 3 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.23 arcsec

|   | Distance in arcsec | Distance / $\sigma$ | $\Delta$ RA       | $\Delta$ Dec       |
|---|--------------------|---------------------|-------------------|--------------------|
| PRF-fit source offset from OOT          | $0.041 \pm 0.073$  | 0.56                | $0.021 \pm 0.078$ | $0.035 \pm 0.071$  |
| PRF-fit source offset from KIC position | $0.221 \pm 0.074$  | 3.01                | $0.098 \pm 0.071$ | $-0.198 \pm 0.072$ |
| photometric centroid source offset      | $0.62 \pm 0.49$    | 1.28                | $0.61 \pm 0.48$   | $0.10 \pm 0.51$    |



Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

Q1 no difference image



Q1 no OOT image



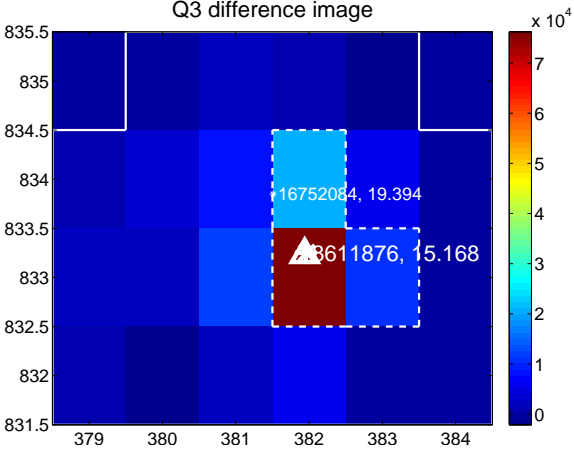
Q2 no difference image



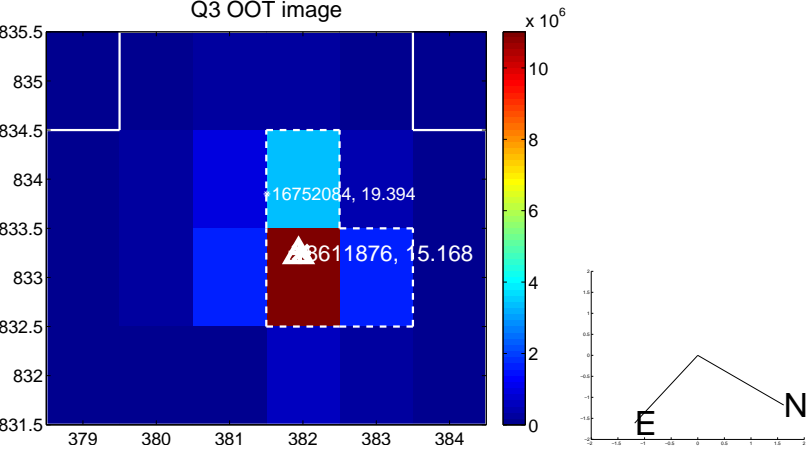
Q2 no OOT image



Q3 difference image



Q3 OOT image



Q4 no difference image

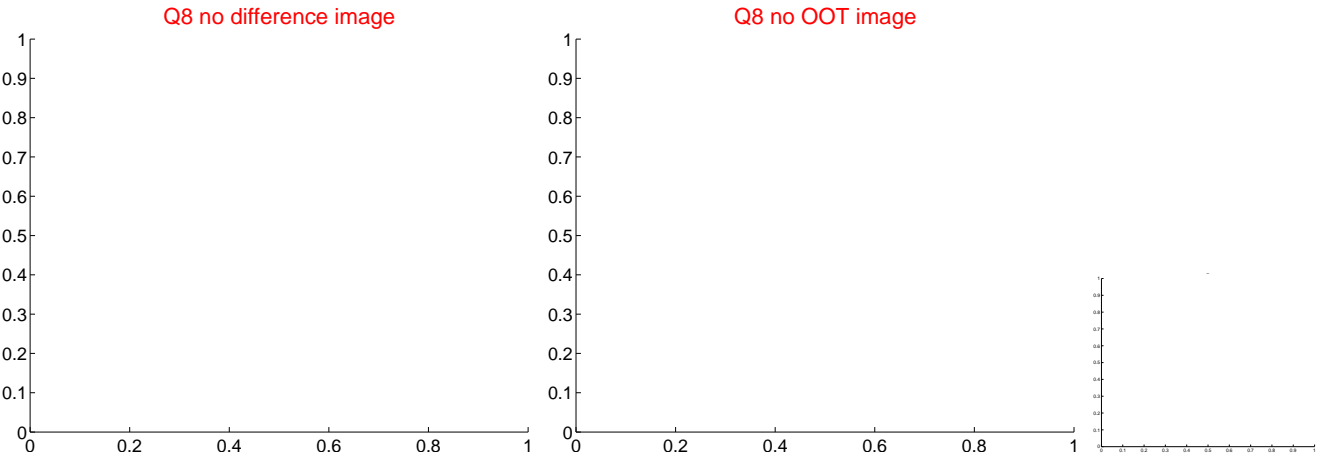
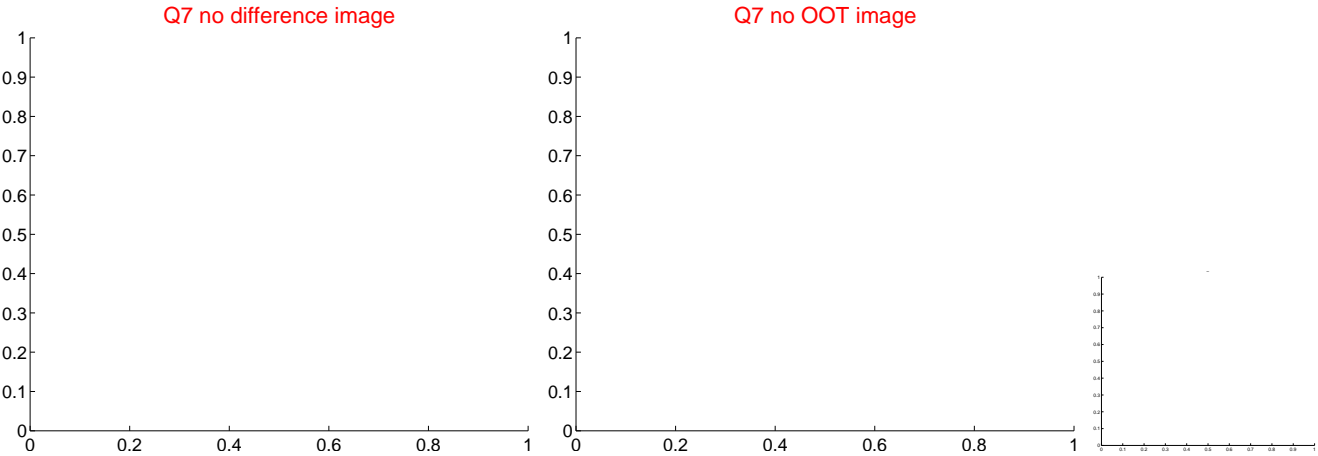
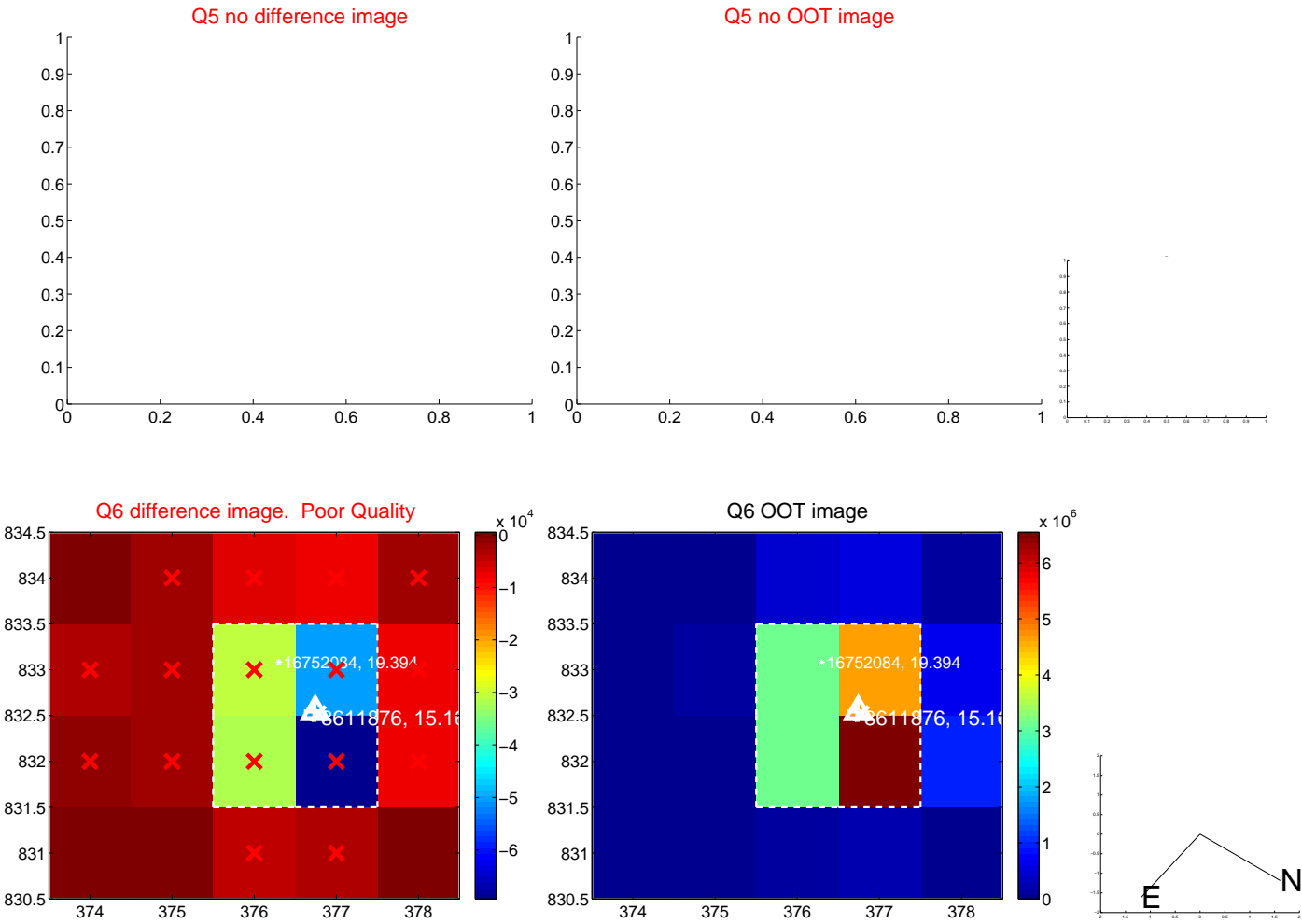


Q4 no OOT image

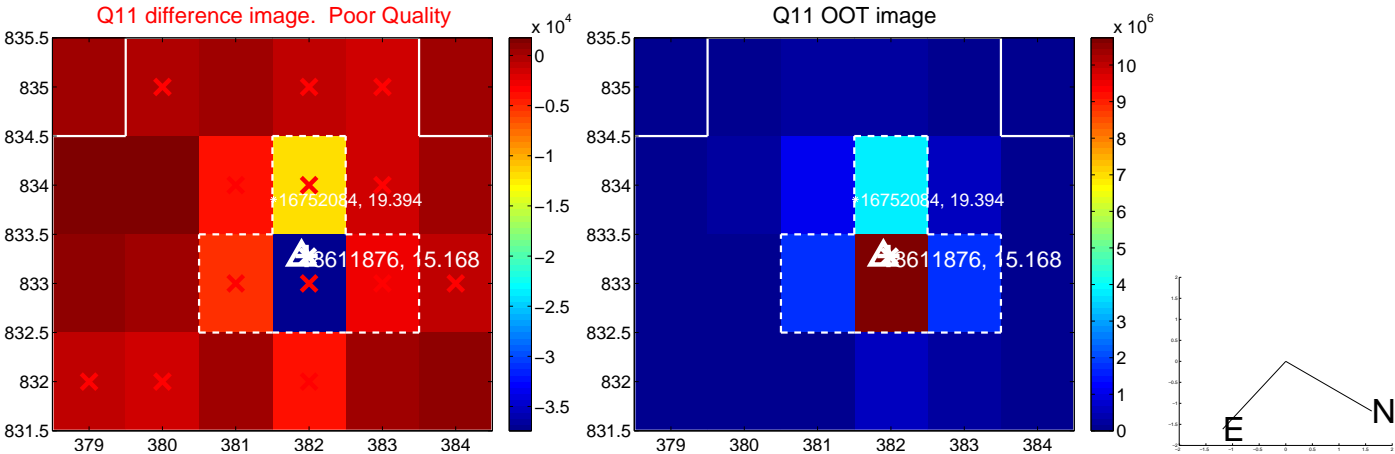
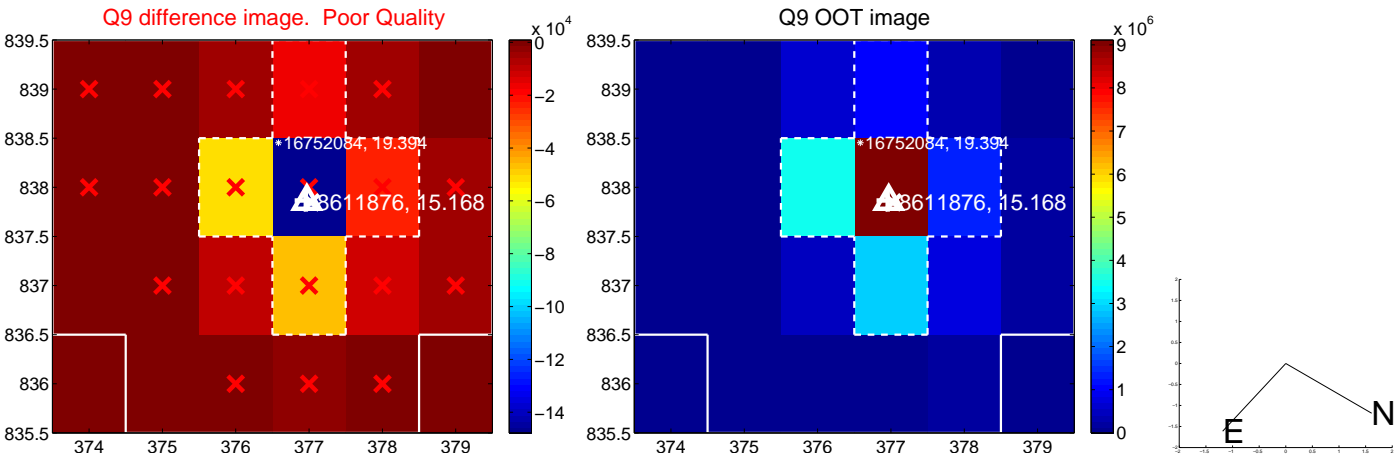




white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

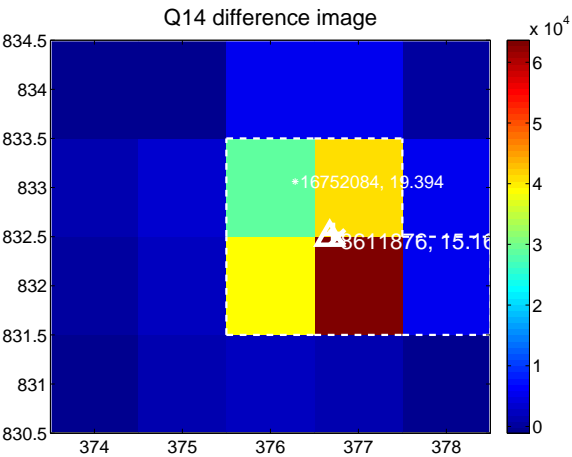
Q13 no difference image



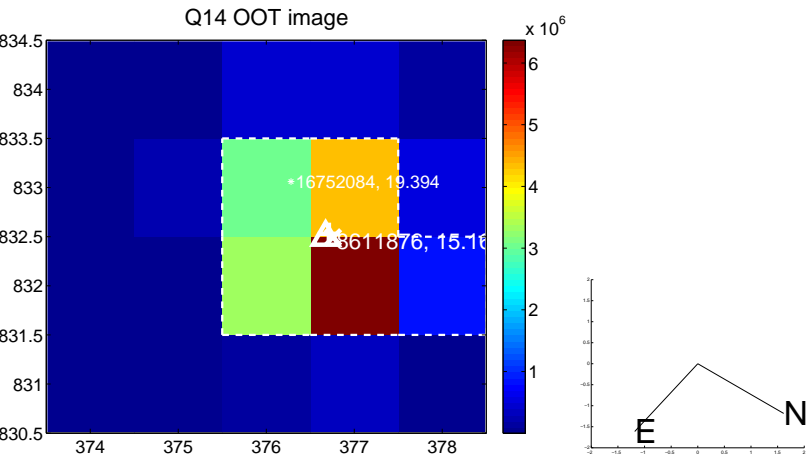
Q13 no OOT image



Q14 difference image



Q14 OOT image



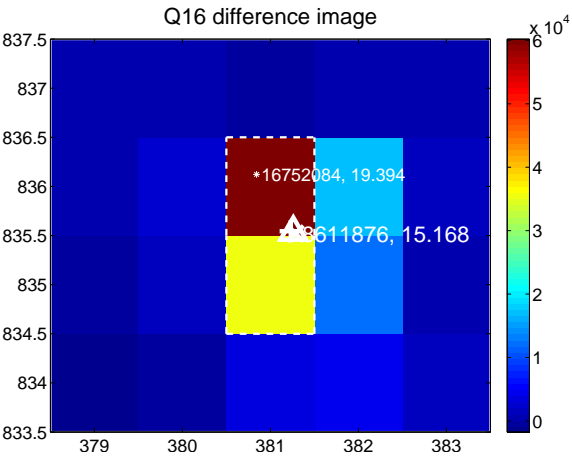
Q15 no difference image



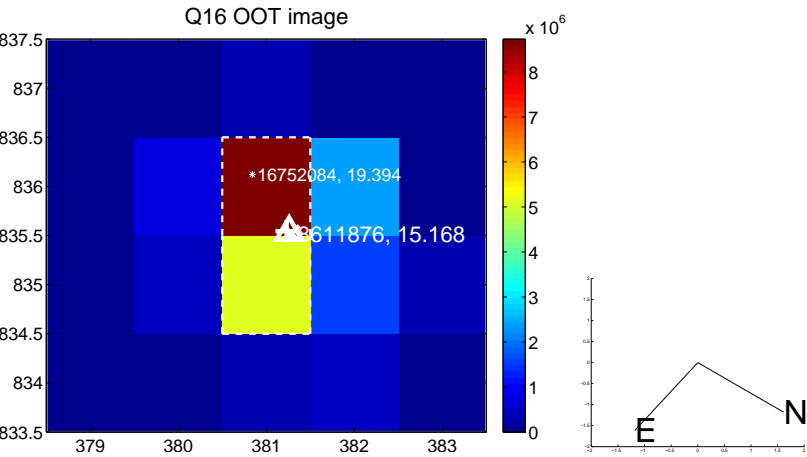
Q15 no OOT image



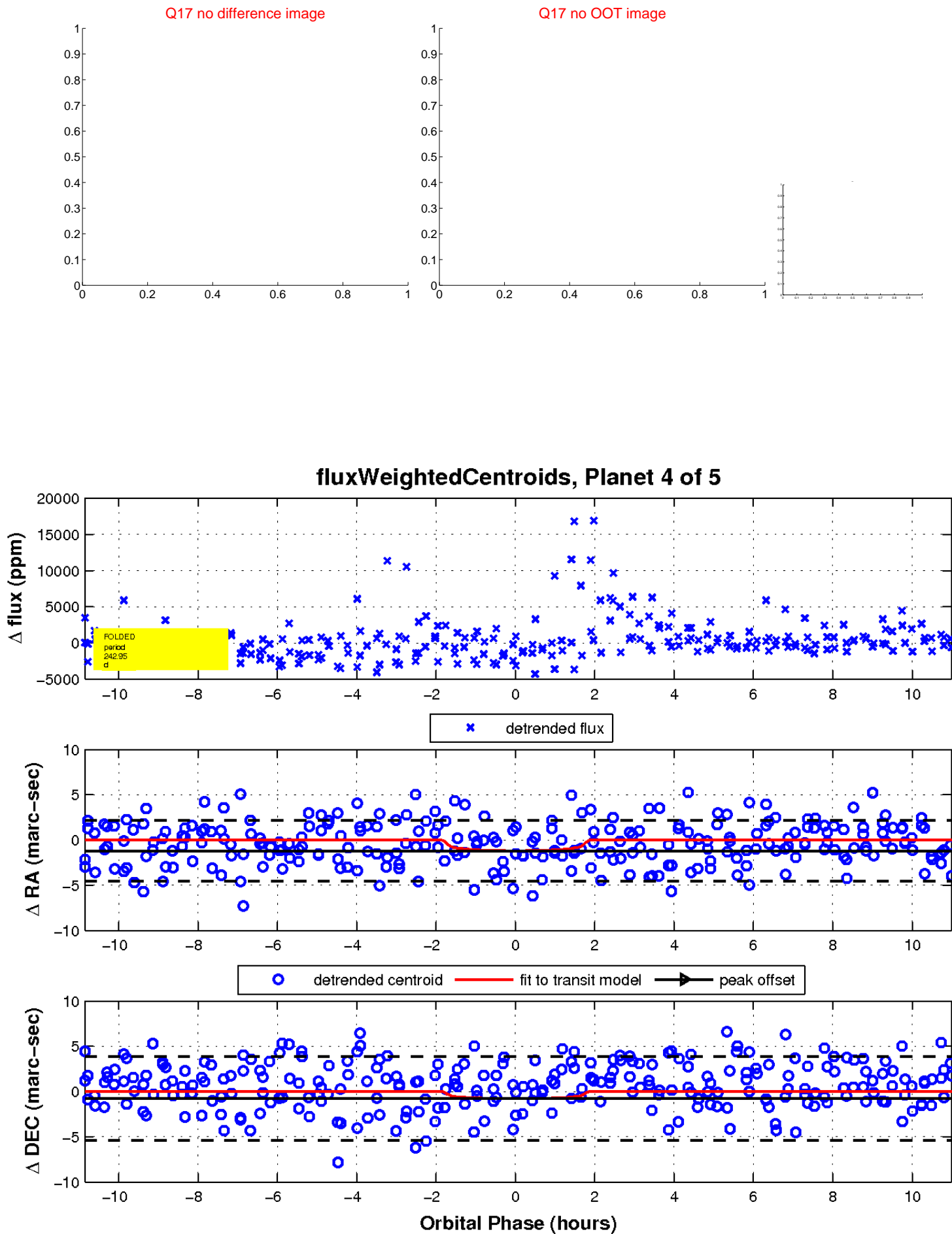
Q16 difference image



Q16 OOT image

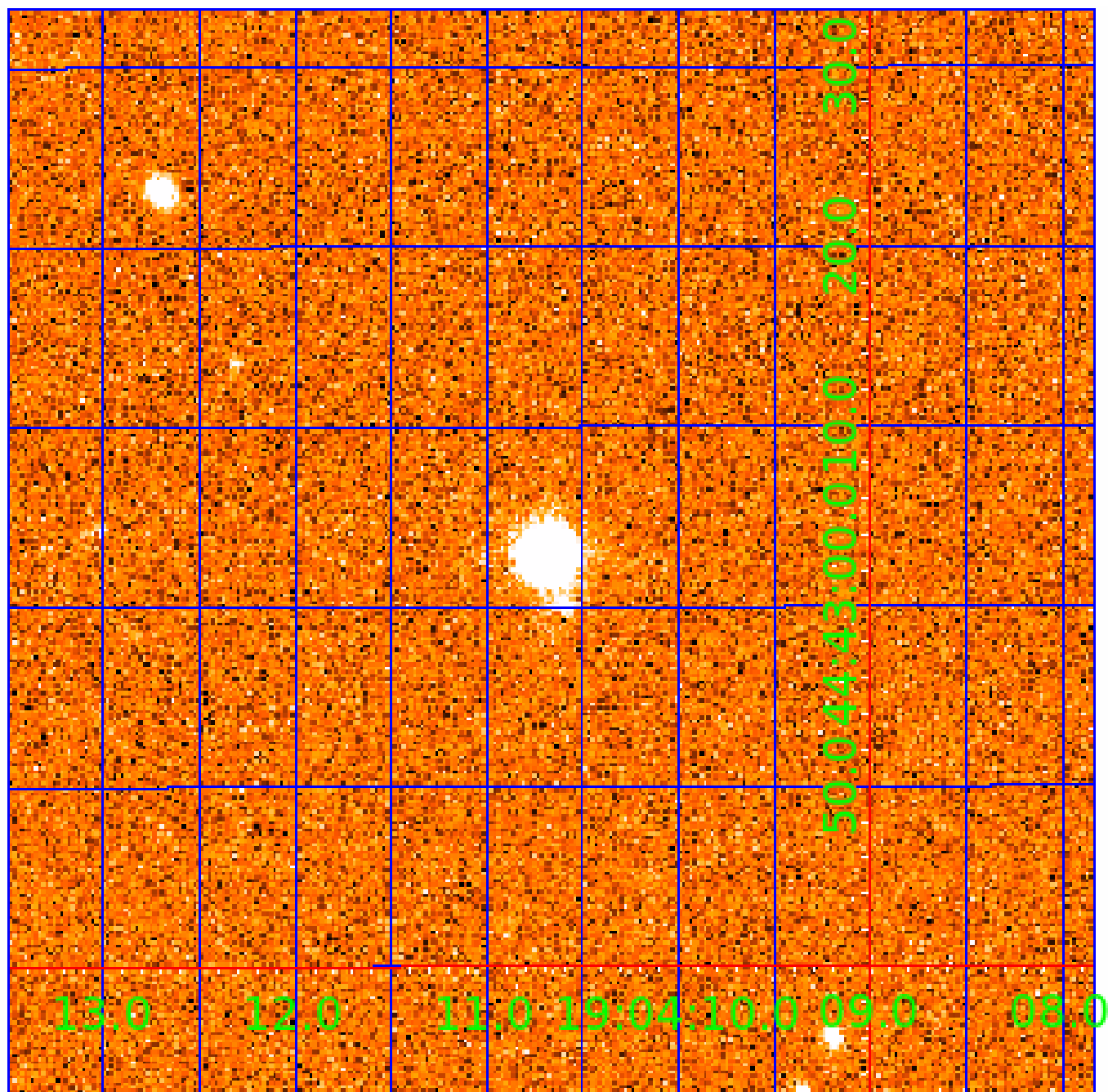


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



# UKIRT Image

Declination



# KIC 008611876

## Q1-17 DR25 TCE Parameters

| TCE          | Run Type | KOI? | Period (Days) | Epoch (BKJD) | Depth (ppm) | Duration (Hours) | MES  | SNR | $R_{\star}$ ( $R_{\odot}$ ) | $T_{\star}$ (K) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|-----|-----------------------------|-----------------|------------------------|------------------------|
| 008611876-01 | OBS      | No   | 624.538021    | 192.227622   | 3450.8      | 4.206            | 13.1 | 7.1 | 0.23                        | 3288            | 1.59                   | 0.01                   |
| 008611876-02 | OBS      | No   | 264.532828    | 391.160973   | 2149.1      | 25.185           | 9.5  | 7.3 | 0.23                        | 3288            | 1.06                   | 0.02                   |
| 008611876-03 | OBS      | No   | 286.745126    | 251.930746   | 3239.9      | 6.687            | 11.7 | 6.6 | 0.23                        | 3288            | 1.30                   | 0.02                   |
| 008611876-04 | OBS      | No   | 242.948585    | 325.990640   | 2444.9      | 3.689            | 11.3 | 7.4 | 0.23                        | 3288            | 1.13                   | 0.03                   |
| 008611876-05 | OBS      | No   | 346.285635    | 168.337816   | 1354.2      | 7.906            | 10.4 | 3.1 | 0.23                        | 3288            | 0.93                   | 0.02                   |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments  |
|--------------|----------|------|-------|---|---|---|---|---|
| 008611876-01 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS |
| 008611876-02 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS                             |
| 008611876-03 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT   |
| 008611876-04 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT   |
| 008611876-05 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS     |

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

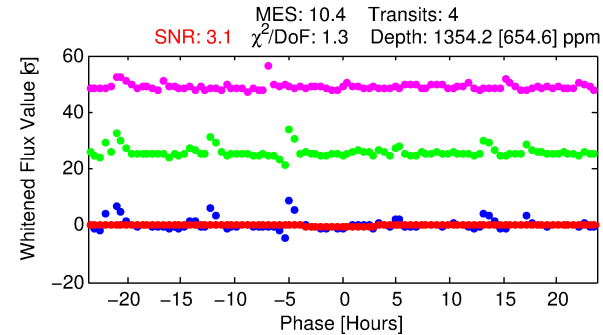
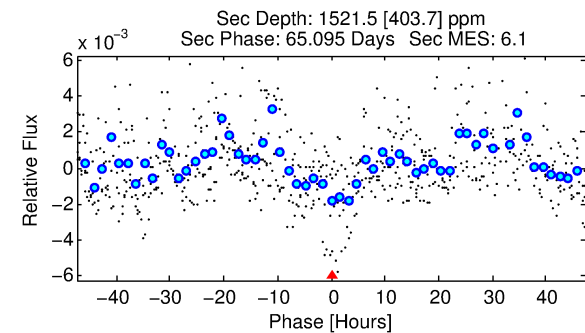
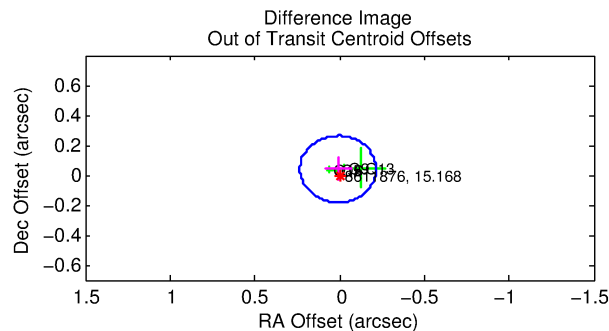
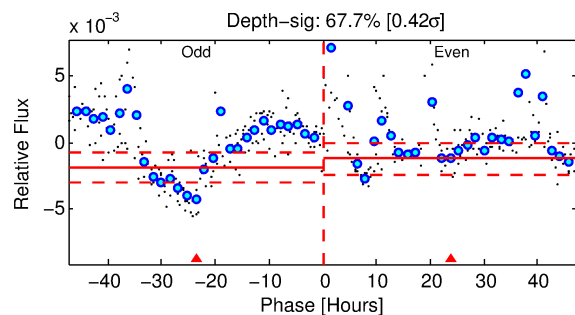
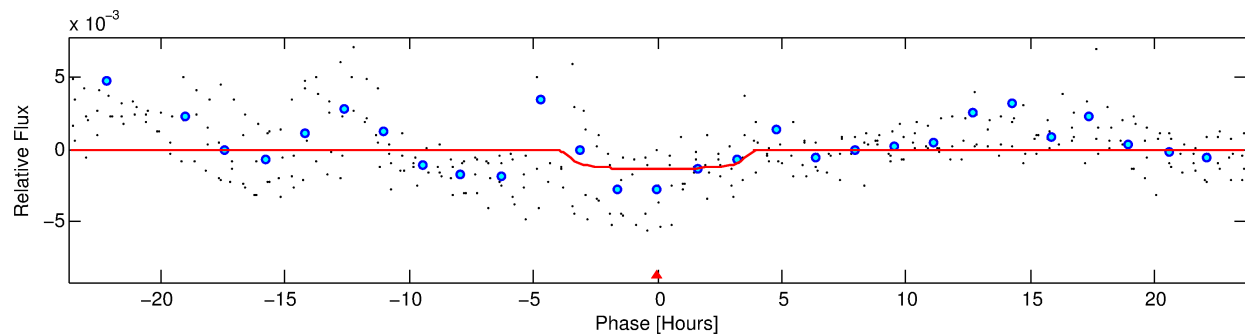
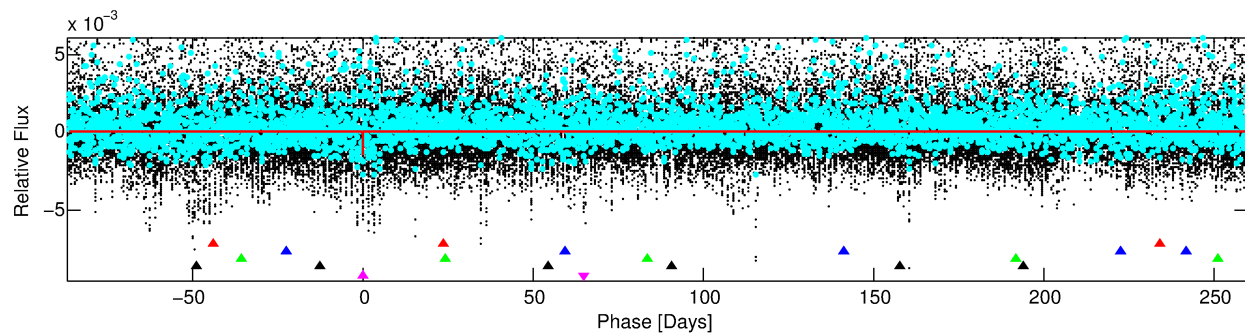
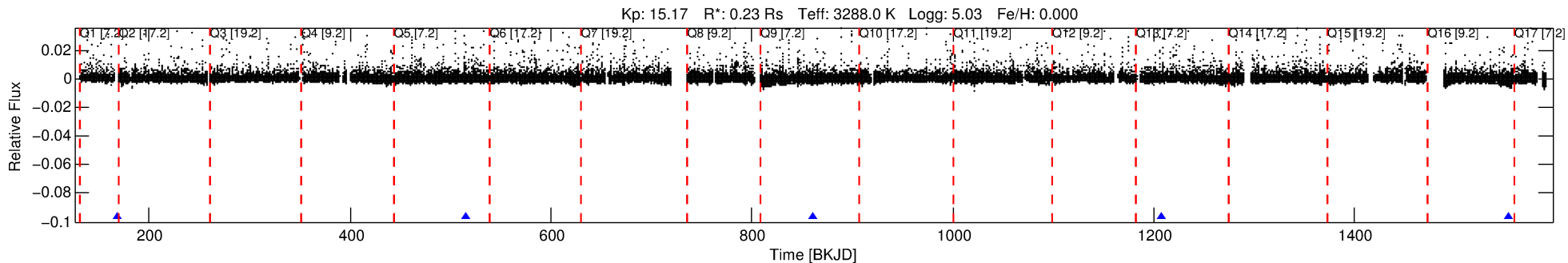
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 008611876-05

No Significant Match Found

# DV One-Page Summary

KIC: 8611876 Candidate: 5 of 5 Period: 346.286 d



## DV Fit Results:

Period = 346.28564 [0.01395] d  
Epoch = 168.3378 [0.0386] BKJD  
Rp/R\* = 0.0369 [0.0183]  
a/R\* = 230.94 [384.47]  
b = 0.77 [0.85]  
Seff = 0.02 [0.00]  
Teq = 92 [3] K  
Rp = 0.93 [0.48] Re  
a = 0.5738 [0.0611] AU  
Ag = 318215.60 [329316.20] [0.97σ]  
Teffp = 3380 [870] K [3.78σ]

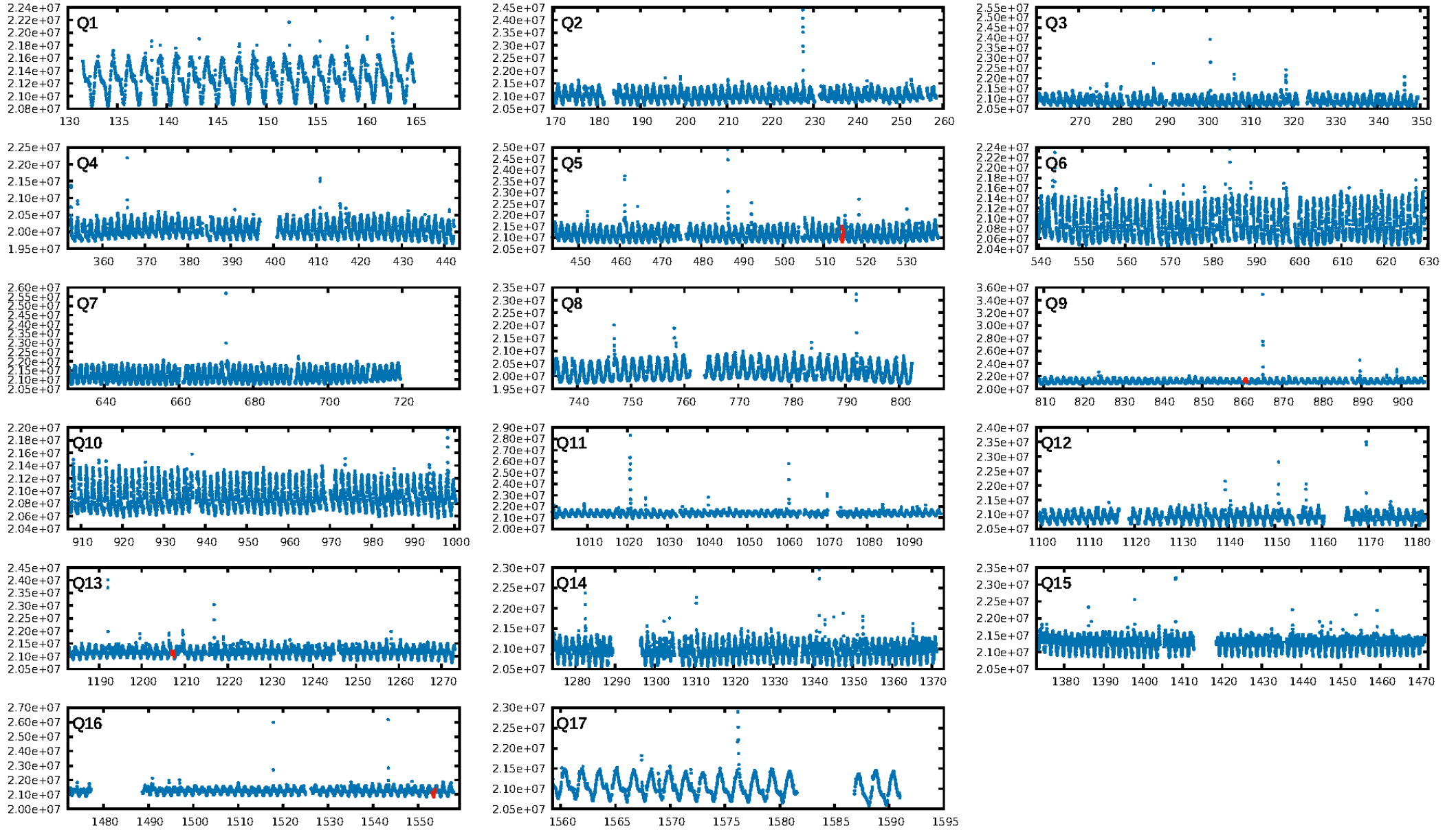
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [138.00σ]  
LongPeriod-sig: 100.0% [745.74σ]  
ModelChiSquare2-sig: 74.1%  
ModelChiSquareGof-sig: 40.2%  
**Bootstrap-pfa: 2.24e-11**  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: 6.962  
Centroid-sig: 4.5%  
Centroid-so: 1.160 arcsec [1.72σ]  
OotOffset-rm: 0.040 arcsec [0.54σ]  
**KicOffset-rm: 0.236 arcsec [3.16σ]**  
OotOffset-st: 0/0/1/3 [4]  
KicOffset-st: 0/0/1/3 [4]  
DiffImageQuality-fgm: 0.50 [2/4]  
DiffImageOverlap-fno: 1.00 [4/4]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 05:49:12 Z

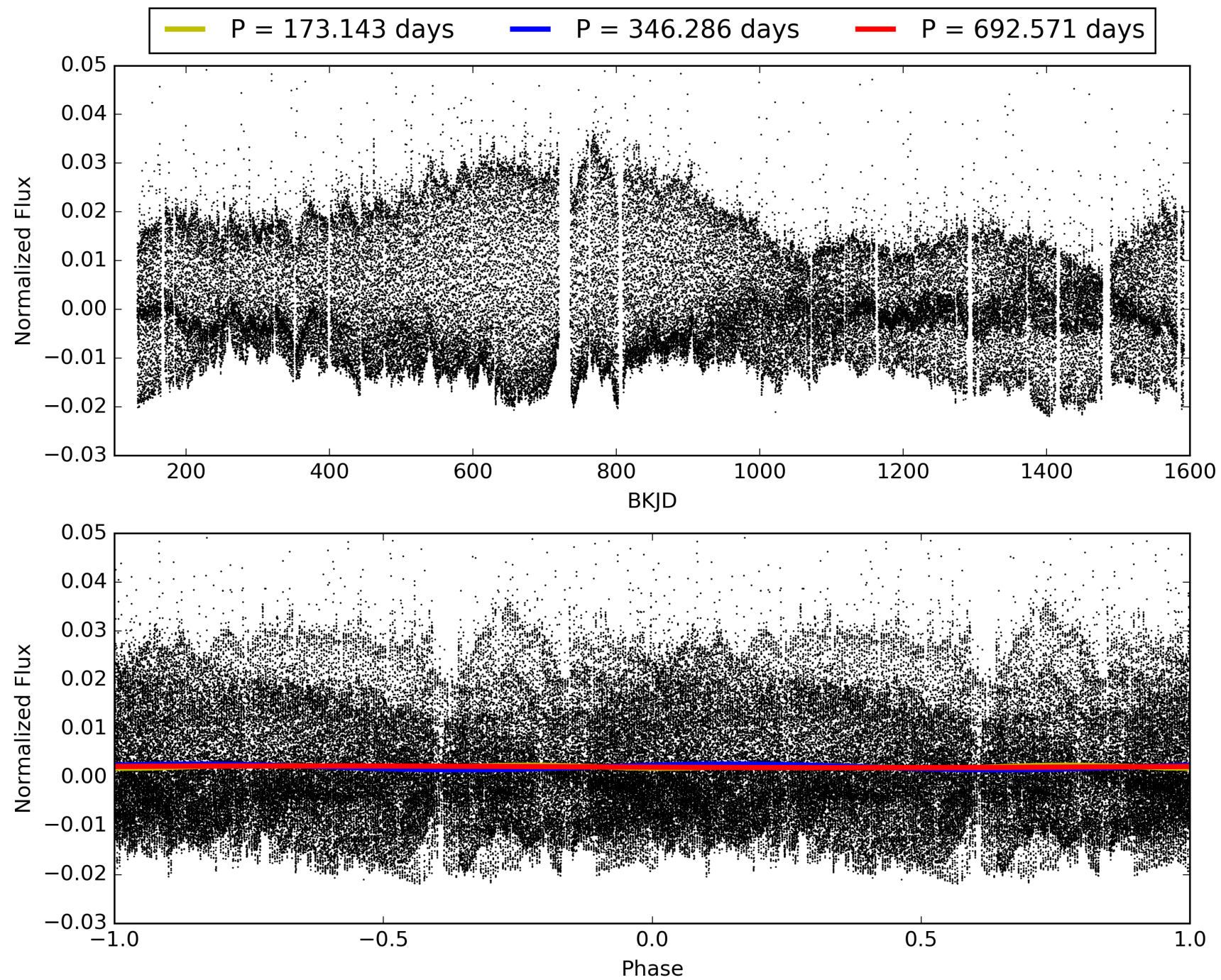
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 008611876-05, PDC Light Curves



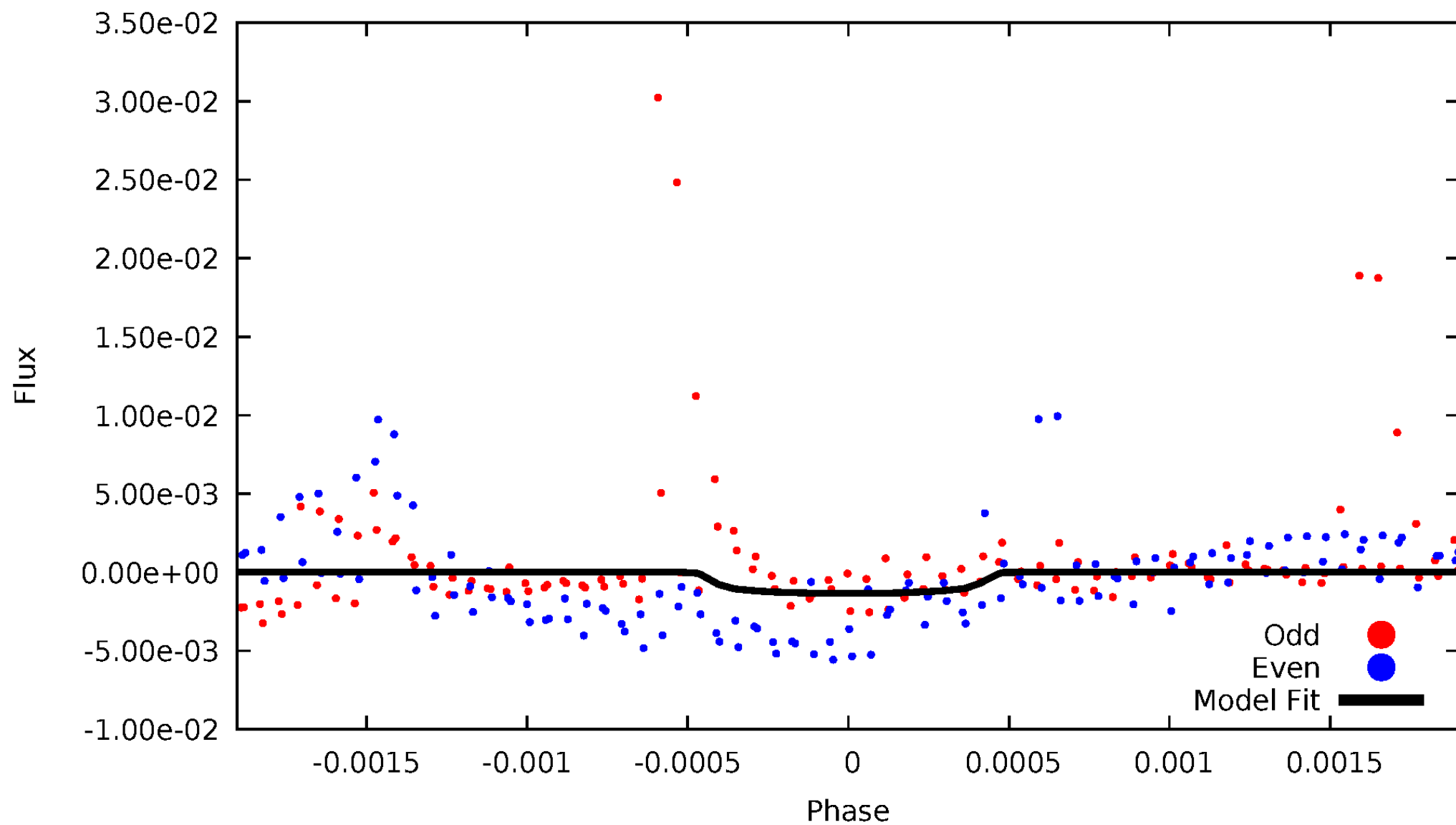


# TCE 008611876-05



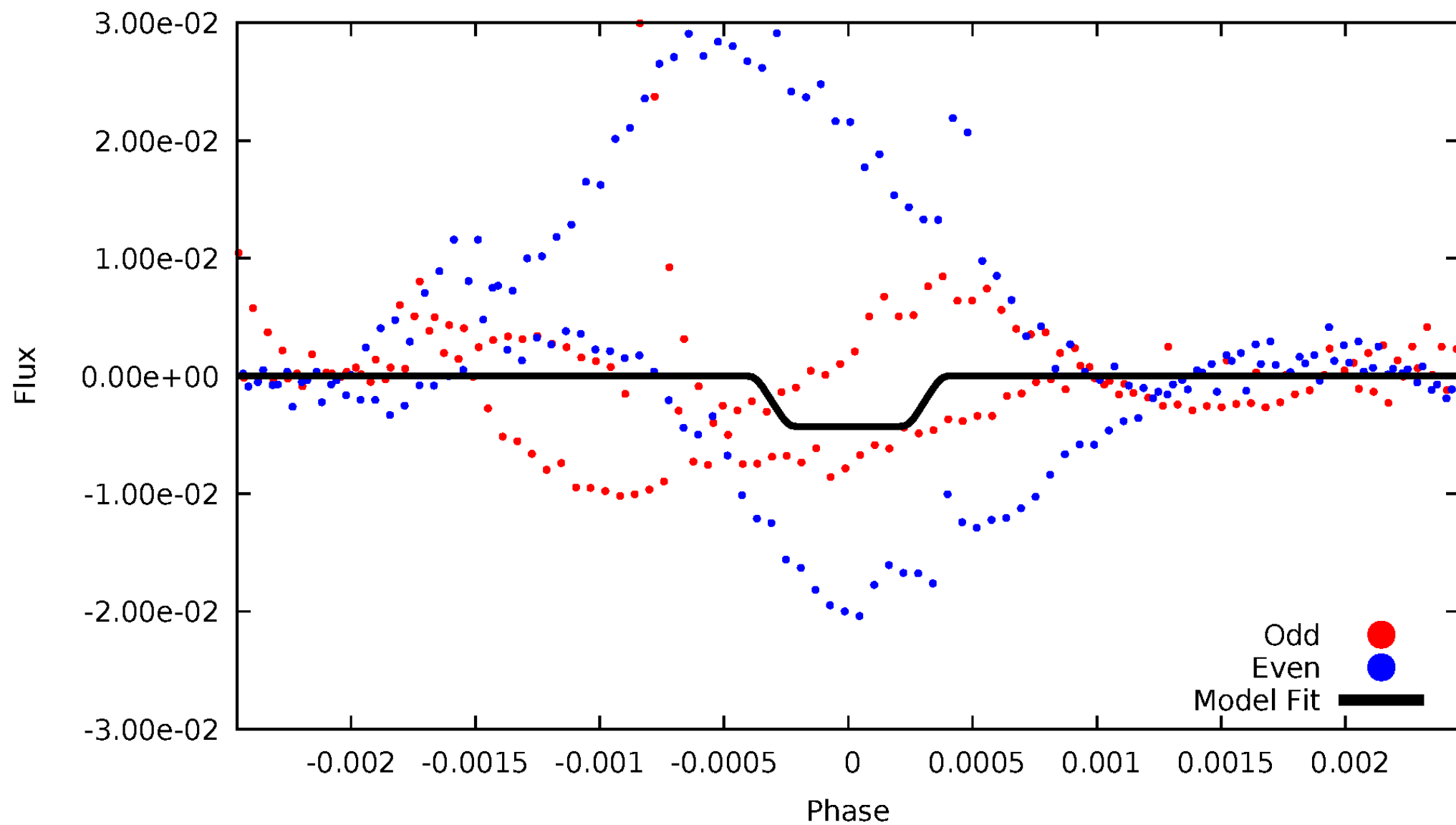
# DV Odd/Even

TCE 008611876-05



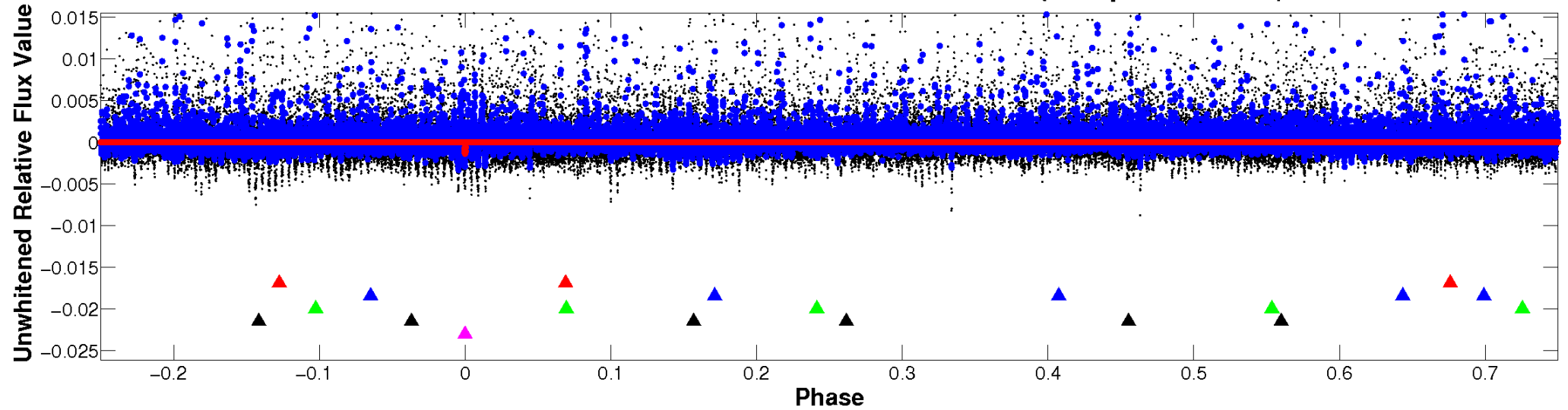
# ALT Odd/Even

TCE 008611876-05

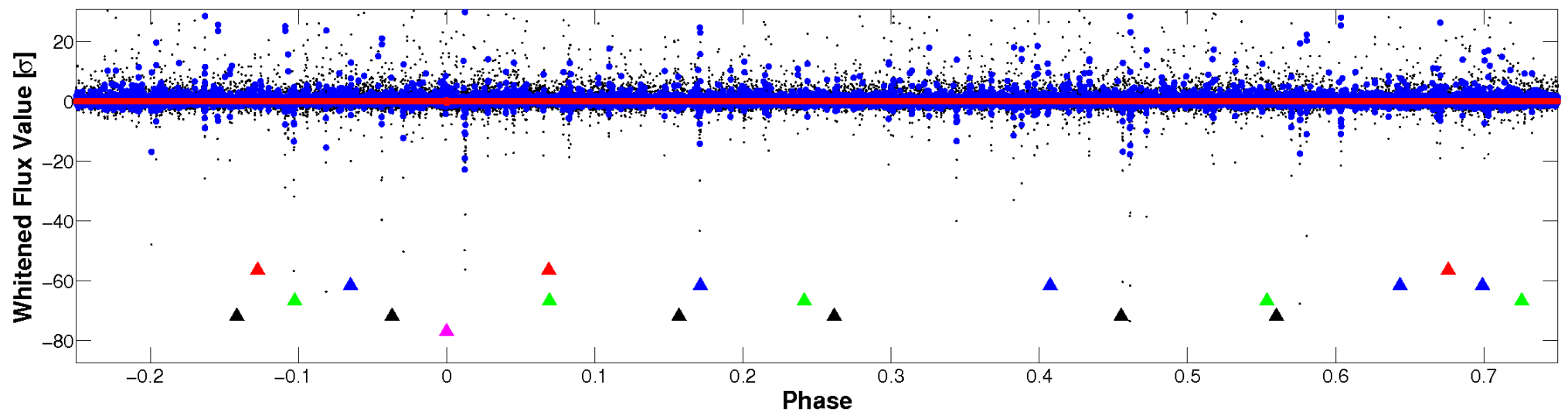


# Non-Whitened Vs. Whitened Light Curve

**Planet 5 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)**

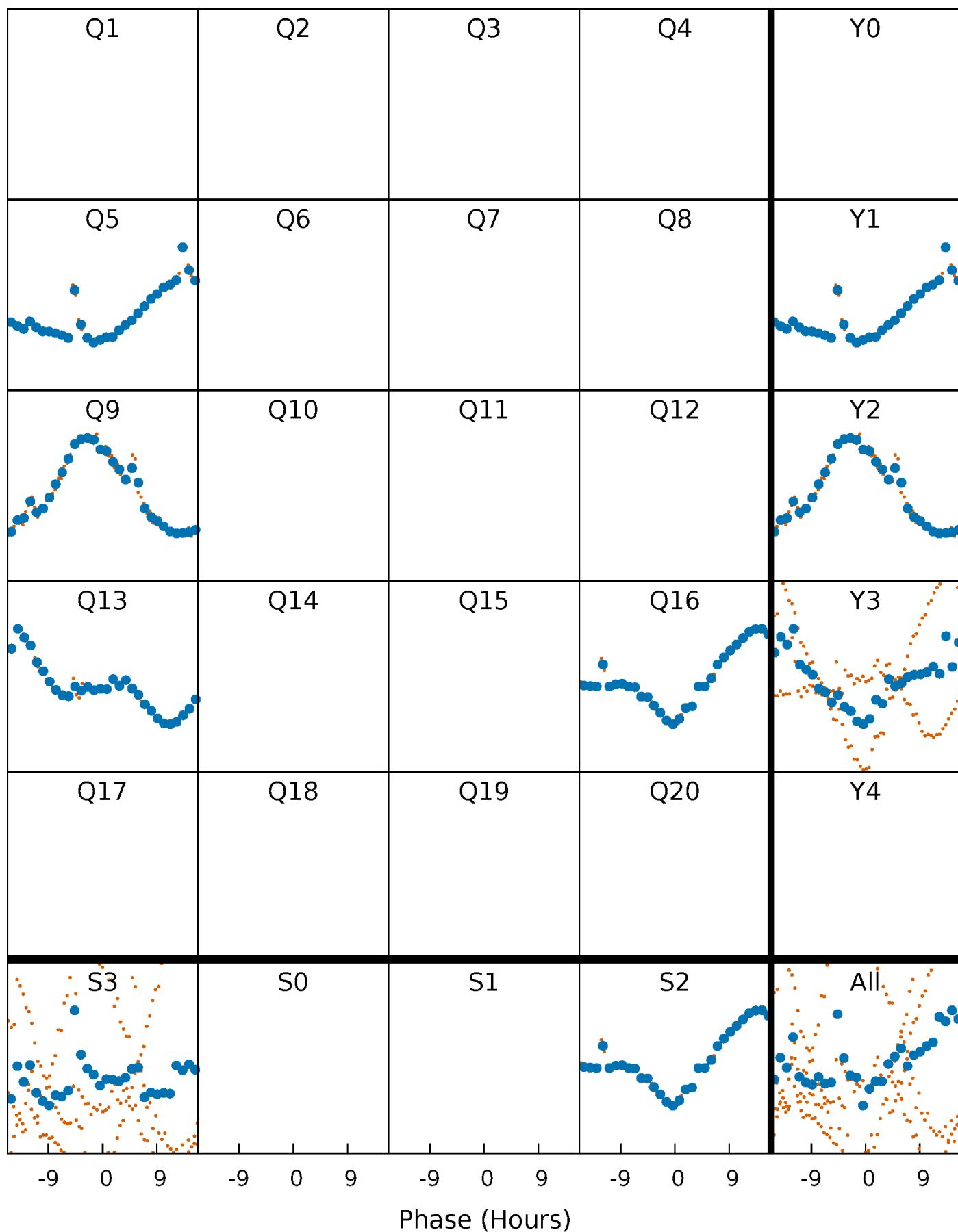


**Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



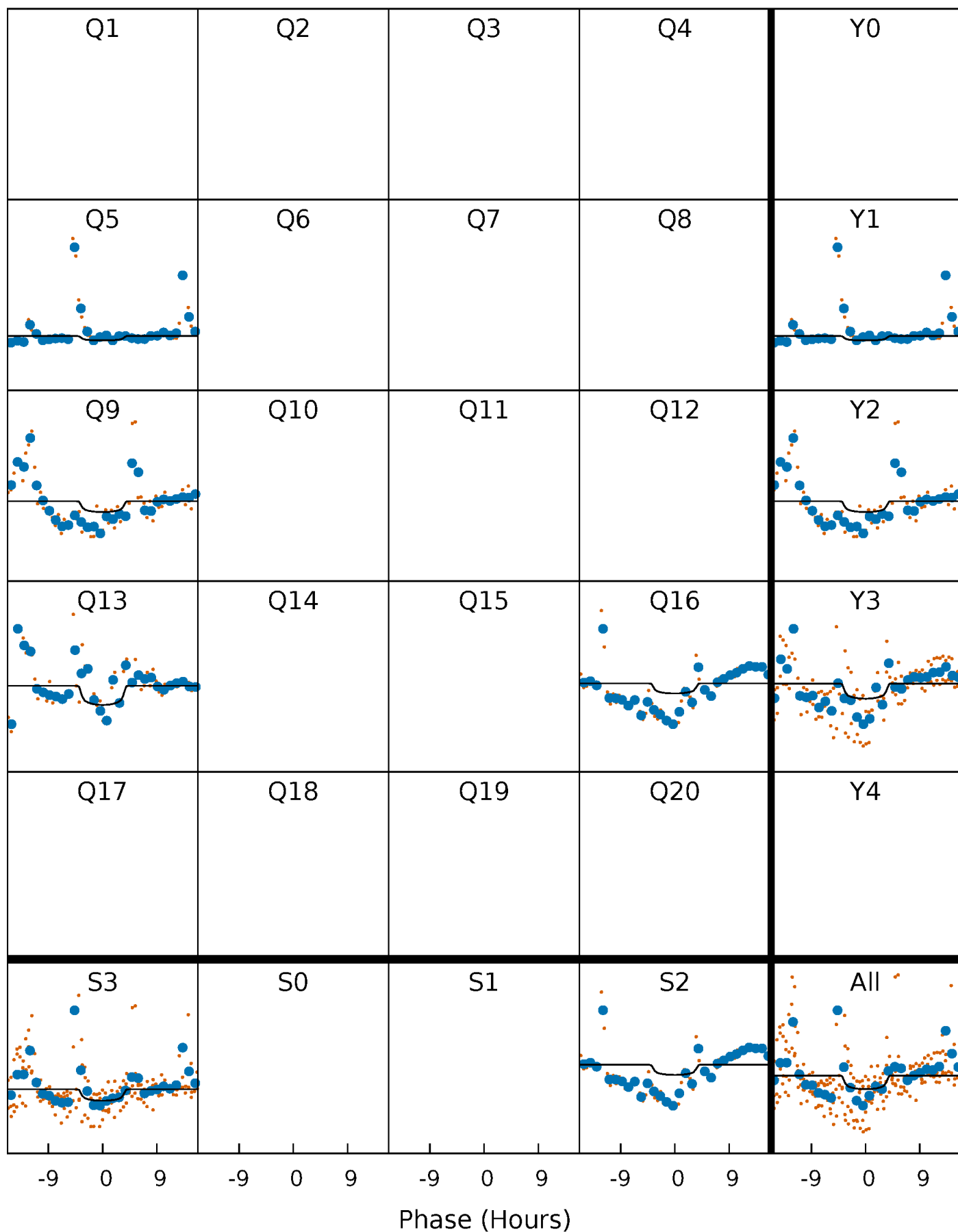
# PDC Quarter-Phased Transit Curves

TCE 008611876-05     $P=346.285635$  Days     $T_0=168.337816$  (BKJD)



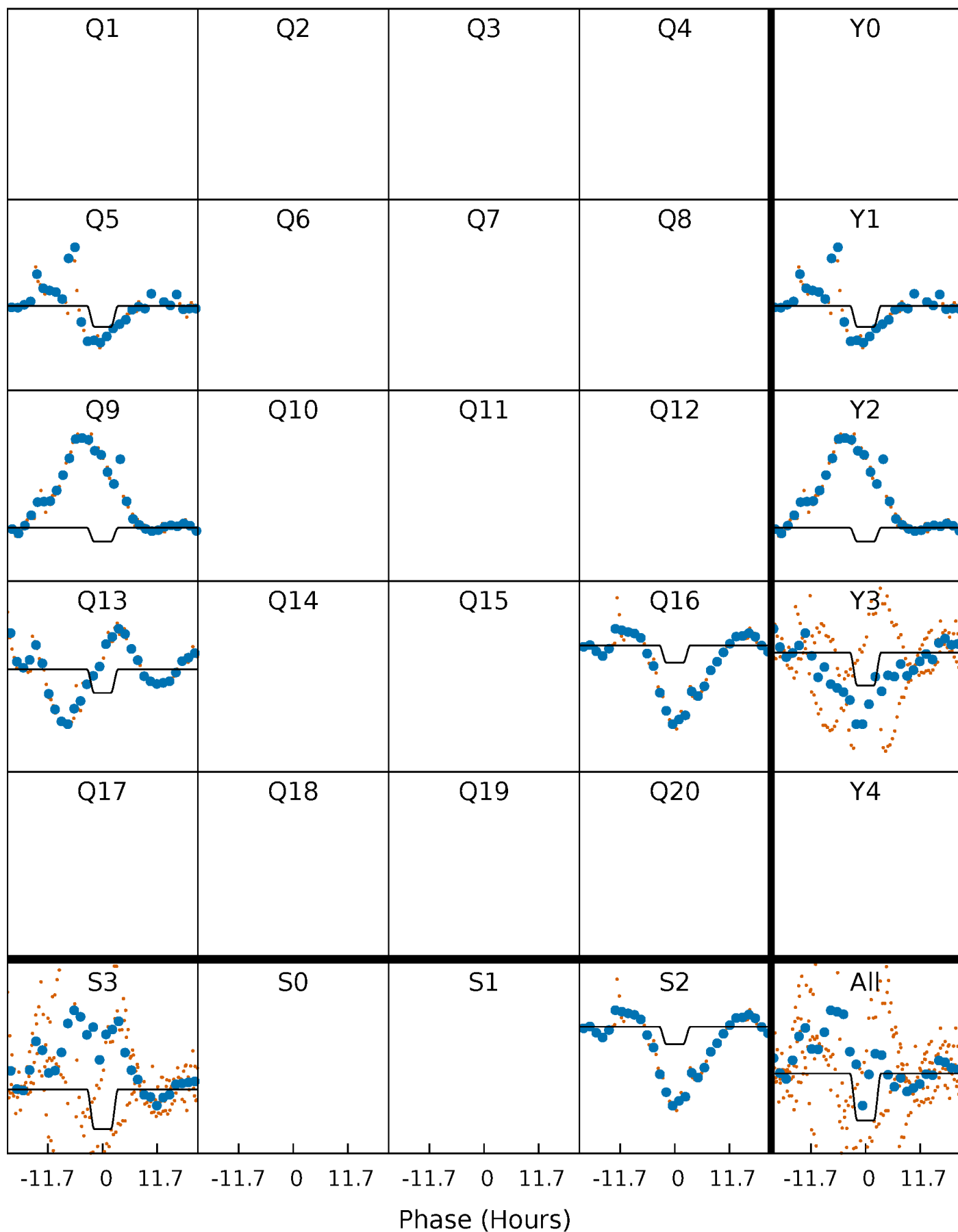
# DV Quarter-Phased Transit Curves

TCE 008611876-05     $P=346.285635$  Days     $T_0=168.337816$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

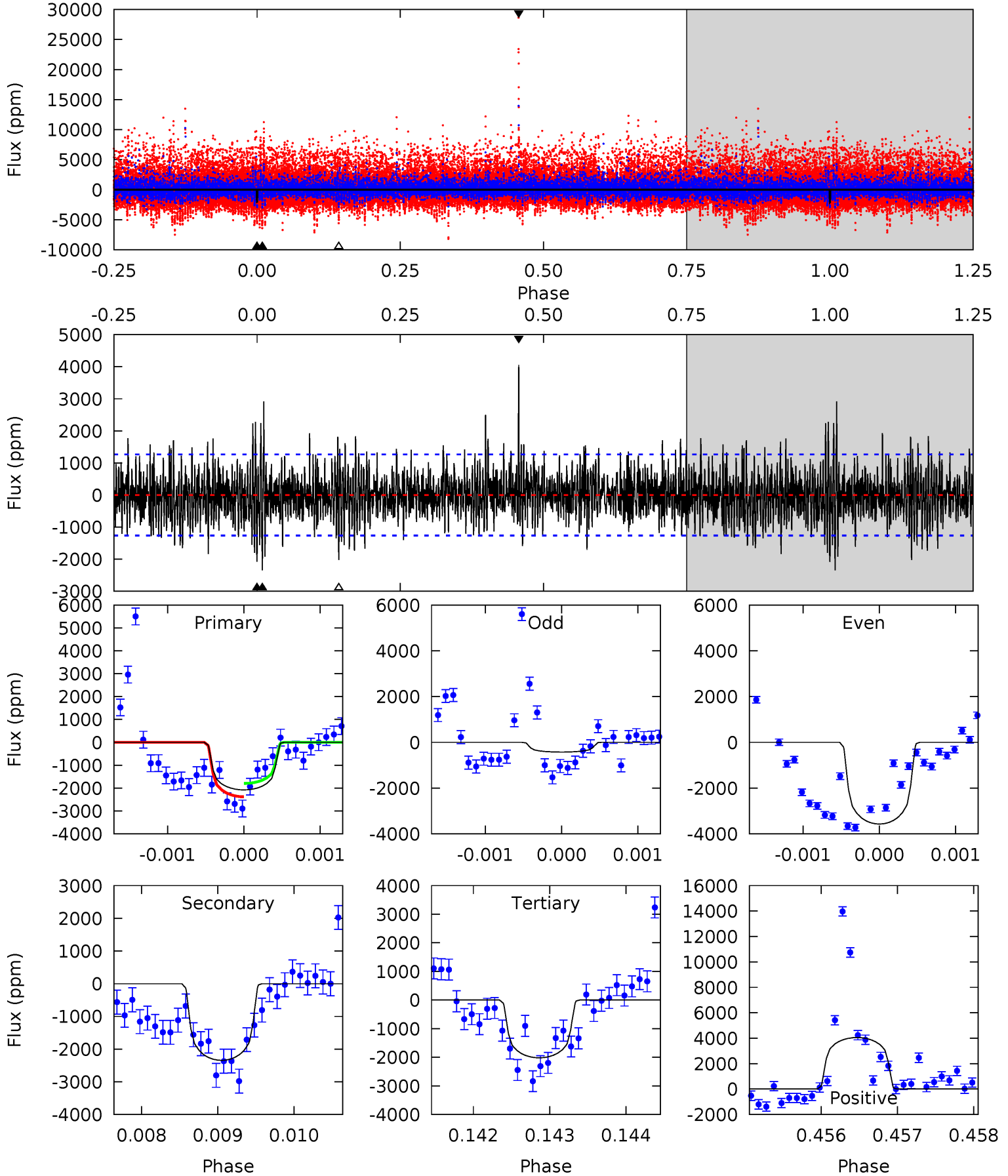
TCE 008611876-05     $P=346.260297$  Days     $T_0=168.448105$  (BKJD)



# DV Model-Shift Uniqueness Test

008611876-05, P = 346.285635 Days, E = 168.337816 Days

| Pri  | Sec  | Ter  | Pos  | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 8.97 | 10.1 | 8.71 | 17.5 | 5.45            | 3.29            | 2.57             | 0.26    | -8.51   | 1.40    | -7.37   | 5.11    | 1.05 | 0.63  | 1.27 |

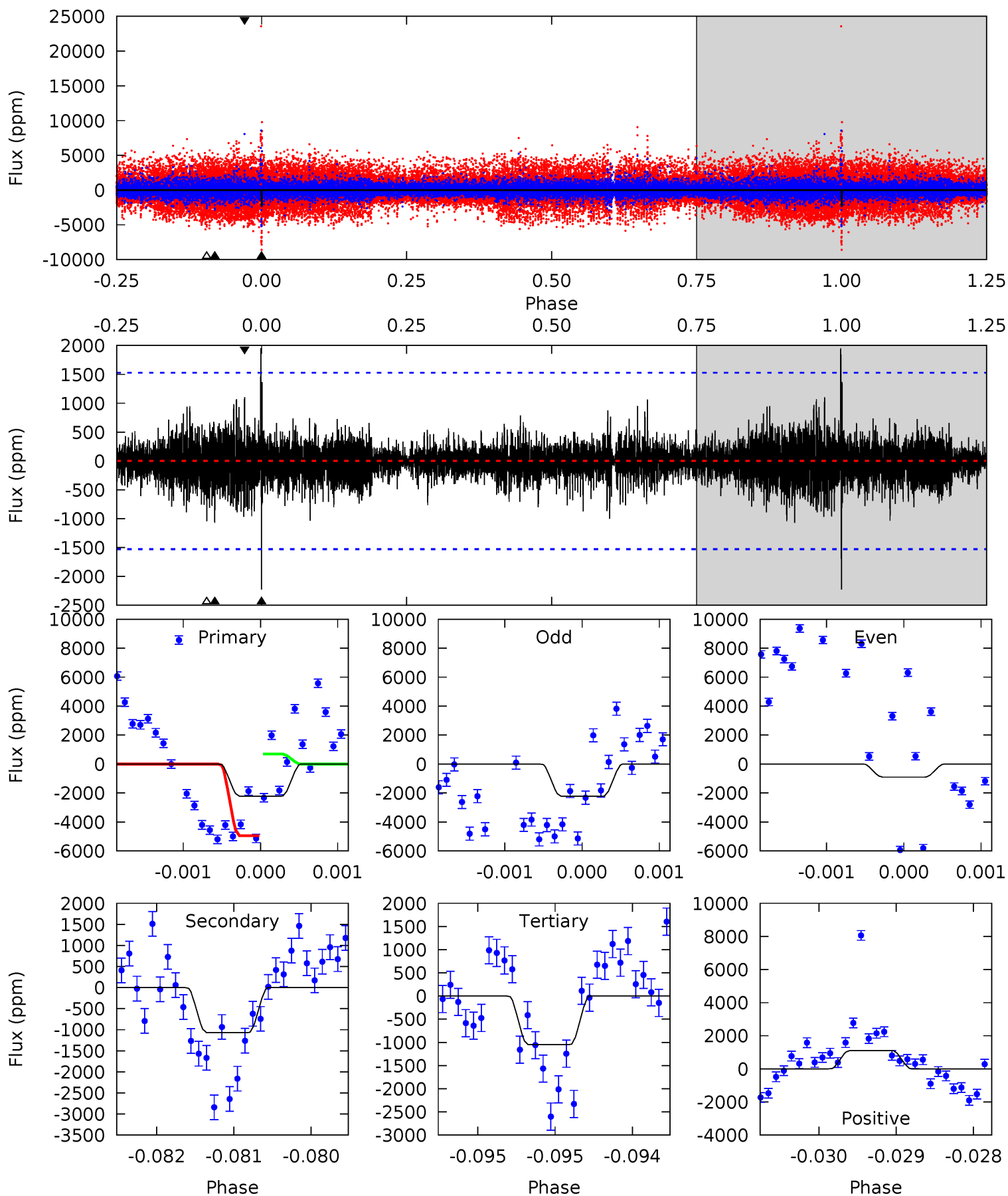




# Alt Model-Shift Uniqueness Test

008611876-05, P = 346.260297 Days, E = 168.448105 Days

| Pri  | Sec  | Ter  | Pos  | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 8.00 | 3.84 | 3.77 | 3.99 | 5.50            | 3.36            | 0.92             | 4.23    | 4.02    | 0.08    | -0.14   | 2.98    | 0.13 | 0.47  | 7.41 |



### Stellar Parameters For KIC 008611876

|        | $T_{\text{eff}}(K)$ | $\log(g)$                 | [Fe/H]                    | $R (R_{\odot})$           | $M(M_{\odot})$            | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|---------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
|        | $3288^{+44}_{-34}$  | $5.033^{+0.044}_{-0.044}$ | $0.000^{+0.100}_{-0.100}$ | $0.231^{+0.035}_{-0.025}$ | $0.210^{+0.041}_{-0.027}$ | $23.930^{+5.802}_{-5.075}$                |
|        | +1%/-1%             | +1%/-1%                   | +inf%/-inf%               | +15%/-11%                 | +20%/-13%                 | +24%/-21%                                 |
| Source | PHO2                | PHO2                      | PHO2                      | DSEP                      |                           |   |

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 008611876-05 / KOI

| Detrend | Depth (ppm)     | $R_p (R_{\oplus})$     | $T_{max} (K)$   | $T_{obs} (K)$        | $A_{obs}$                     |
|---------|-----------------|------------------------|-----------------|----------------------|-------------------------------|
| DV      | $-2344 \pm 232$ | $0.94^{+0.46}_{-0.45}$ | $129^{+3}_{-3}$ | $3578^{+938}_{-399}$ | $478638^{+1348633}_{-259360}$ |
| Alt.    | $-1068 \pm 278$ | $1.65^{+0.49}_{-0.45}$ | $129^{+3}_{-3}$ | $2699^{+253}_{-186}$ | $69305^{+65685}_{-30607}$     |

$T_{max}$  = Theoretical Maximum Planetary Temperature

$T_{obs}$  = Observed Planetary Temperature (Assuming A=0.3)

$A_{obs}$  = Observed Albedo (Assuming T=0)

If a secondary eclipse is present, the system is likely an EB if  $T_{obs} \gg T_{max}$  AND  $A_{obs} \gg 1.0$

## DV Centroid Data

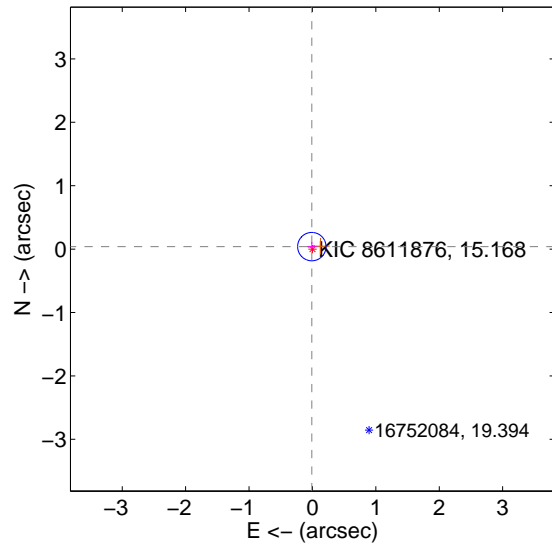
Supplemental centroid analysis for 008611876-05. Kepler magnitude: 15.17. Transit SNR 3.13

There are 2 quarters with good PRF difference image offsets

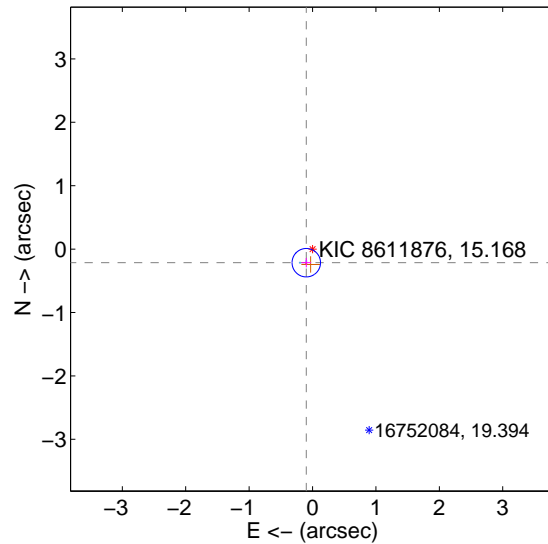
The direct PRF centroid is offset from the target star catalog position by about 0.23 arcsec

|   | Distance in arcsec | Distance / $\sigma$ | $\Delta$ RA       | $\Delta$ Dec       |
|---|--------------------|---------------------|-------------------|--------------------|
| PRF-fit source offset from OOT          | $0.040 \pm 0.075$  | 0.54                | $0.010 \pm 0.076$ | $0.039 \pm 0.074$  |
| PRF-fit source offset from KIC position | $0.236 \pm 0.075$  | 3.16                | $0.098 \pm 0.076$ | $-0.215 \pm 0.074$ |
| photometric centroid source offset      | $1.16 \pm 0.67$    | 1.72                | $1.07 \pm 0.66$   | $0.45 \pm 0.73$    |

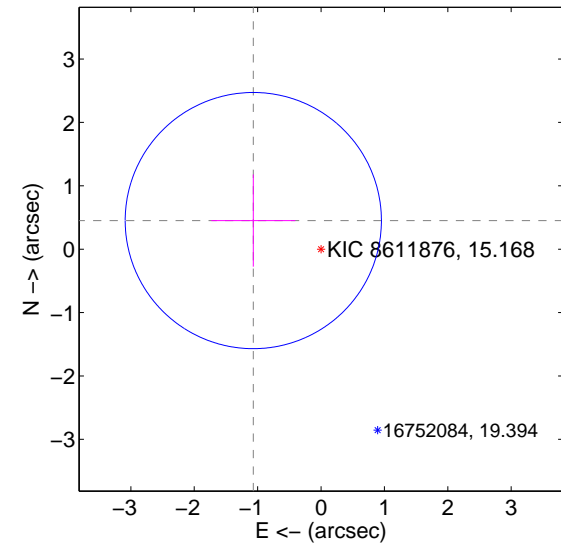
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids

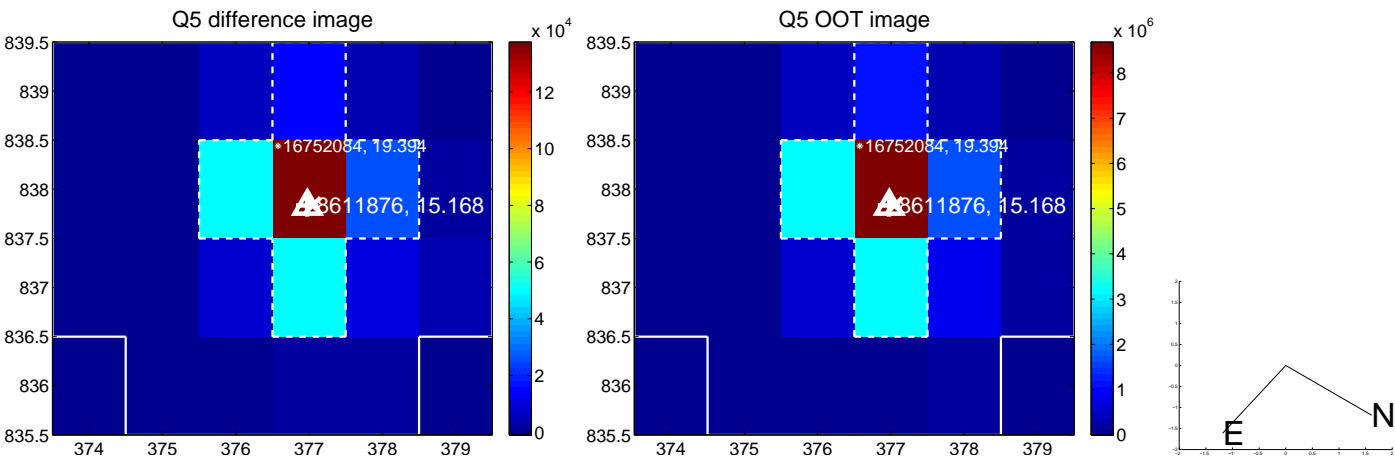


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

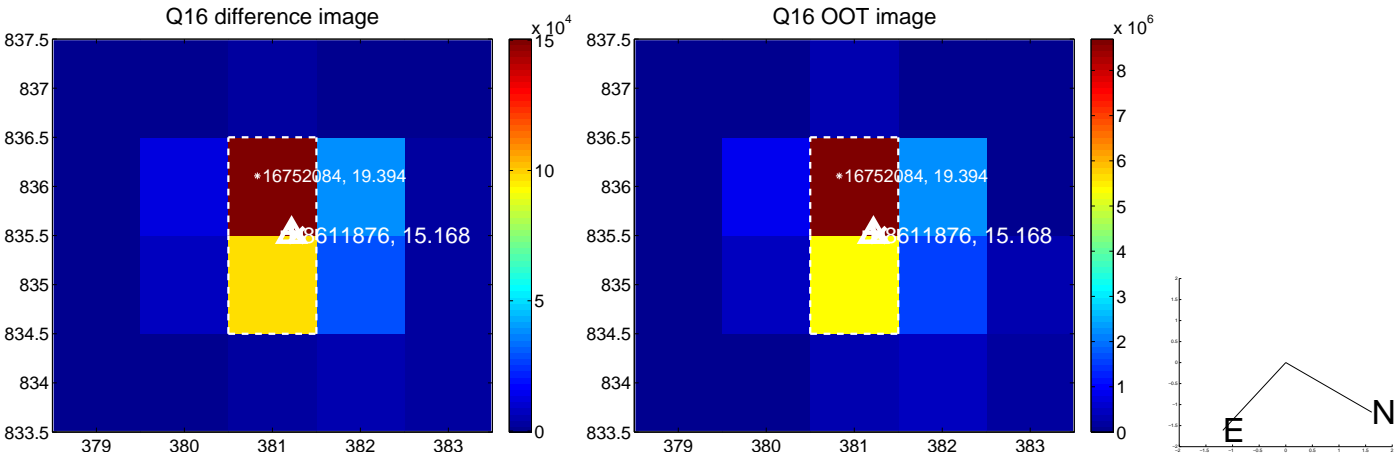
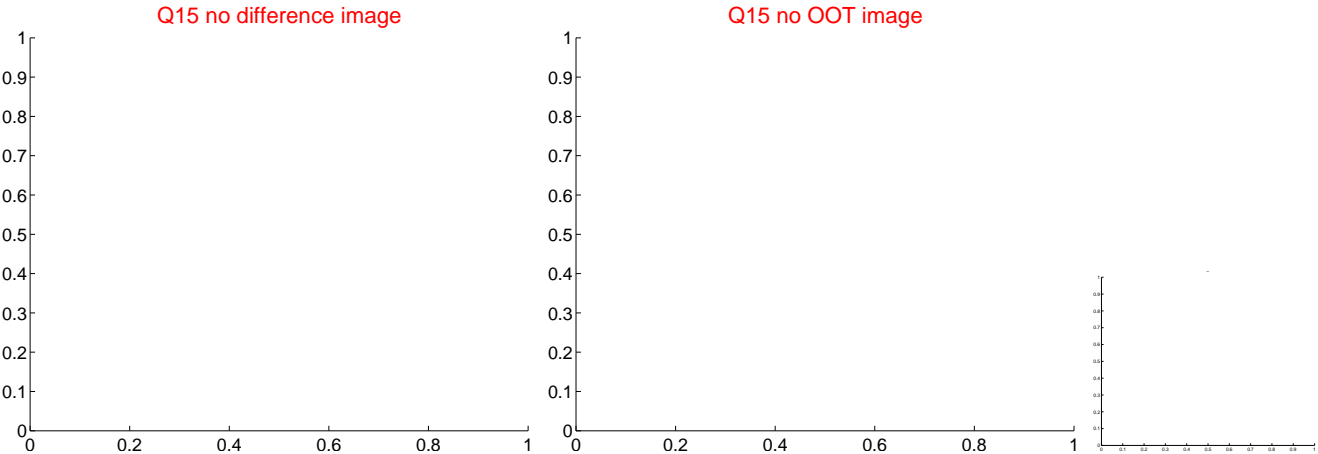
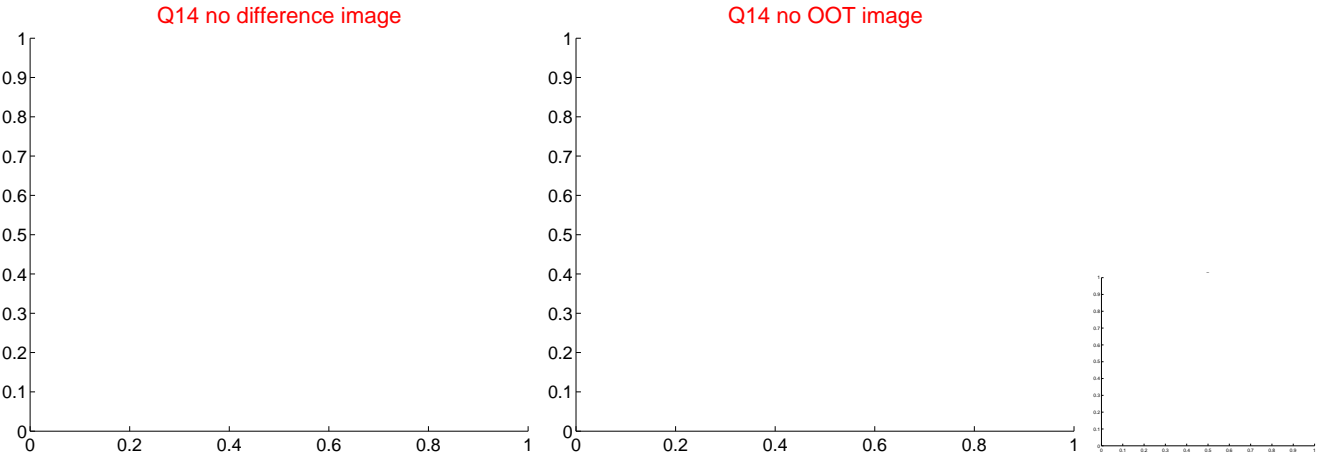
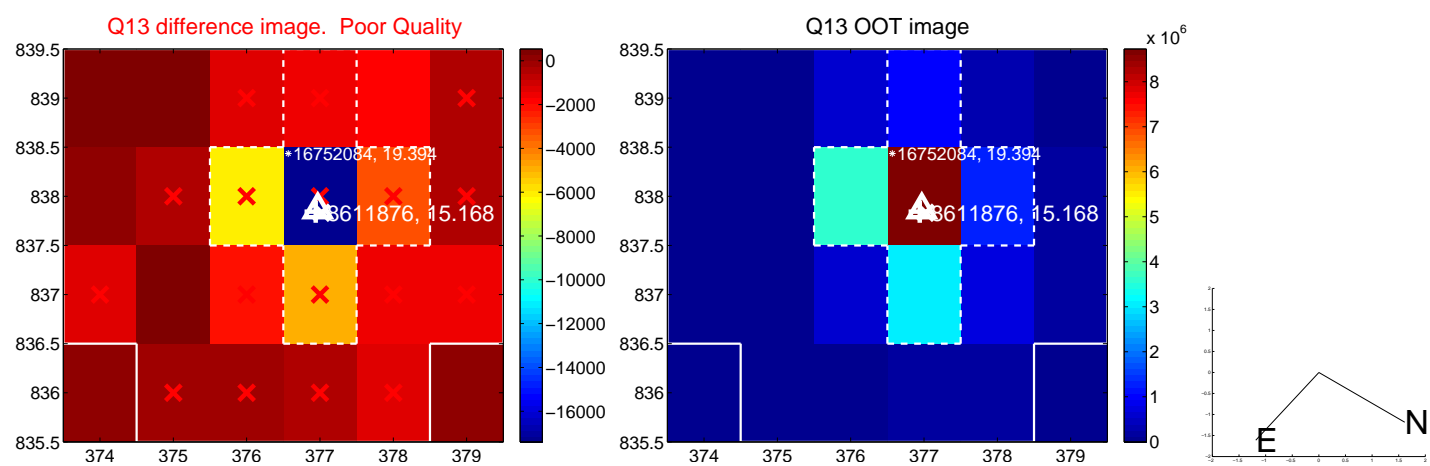


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

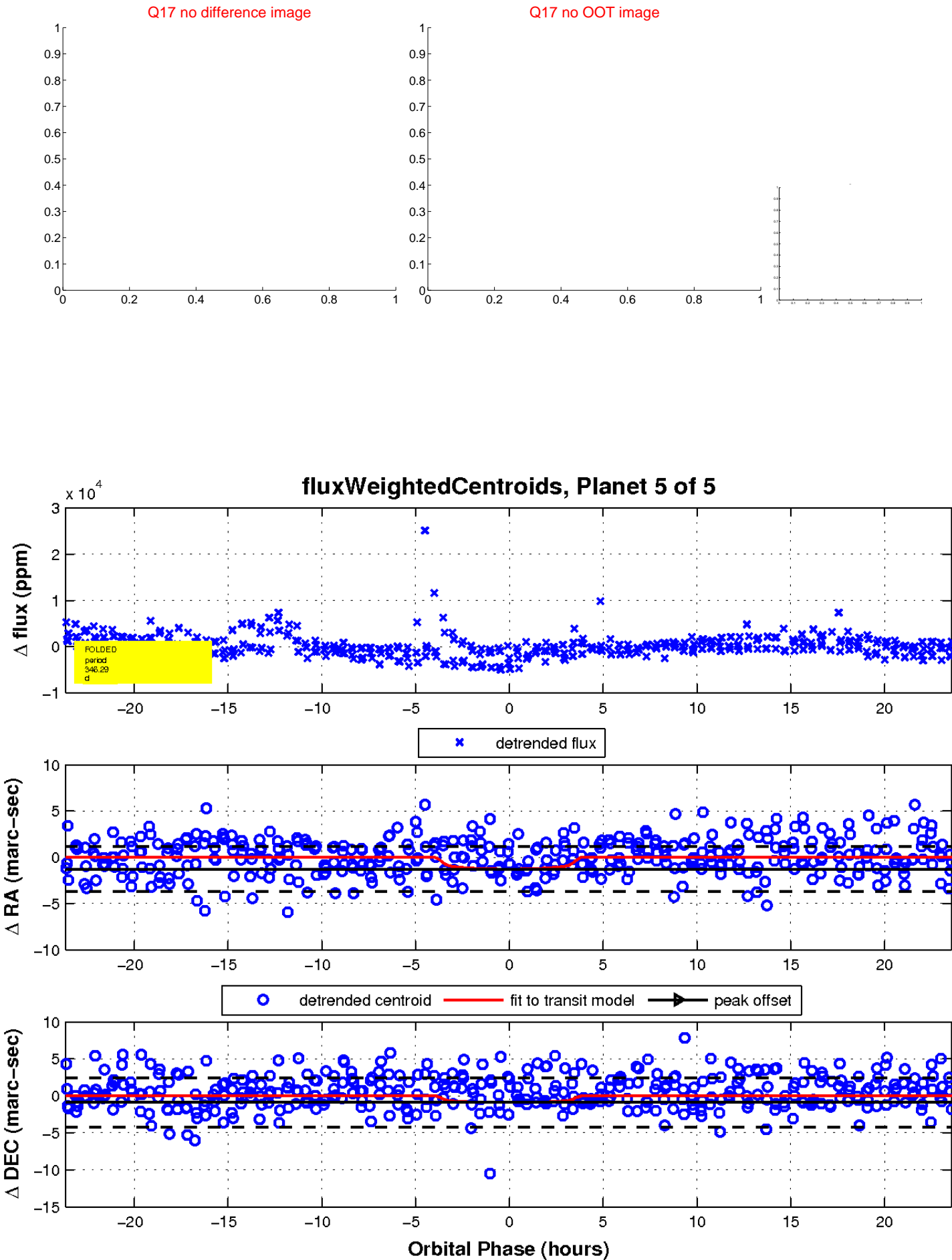




white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





# UKIRT Image

Declination

